hallicrafters

OPERATING AND SERVICE INSTRUCTIONS

FOUR-BAND
COMMUNICATIONS RECEIVER
MODEL SX-122

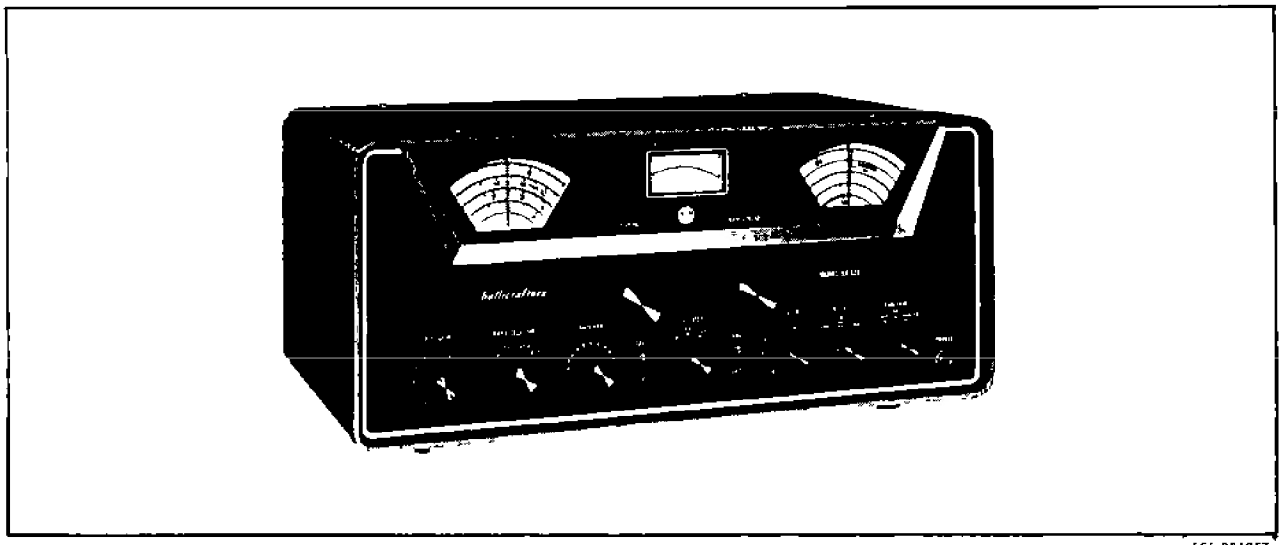

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Figure 1. Hallicrafters' Model SX-122 Receiver.

SECTION I
GENERAL DESCRIPTION

The Hallicrafters' Model SX-122 Communications Receiver is a four-band dual-conversion superheterodyne receiver tuning from 540 to 1600 kilocycles (KC) and 1.75 to 34 megacycles (MC) with calibrated electrical bandspread provided on the 80, 40, 20, 15, 10 meter and citizens bands. The frequency range covers foreign and domestic short-wave broadcasts, amateurs, aircraft, and marine plus standard AM broadcasts. The receiver provides for the reception of code (CW), voice (AM), and single-sideband (SSB) signals over its entire tuning range, the upper or lower sideband being readily selectable by means of a front-panel control. This feature greatly simplifies tuning of single-sideband signals.

The SX-122 Receiver employs dual conversion on all bands to obtain optimum image rejection. A high order of selectivity is made possible by the use of a 50-KC second-IF system with four high-Q, permeability-tuned circuits. Receiver selectivity is variable in three steps: 0.5 KC, 2.5 KC, and 5 KC at 6 DB down.

A tuned-RF stage assures maximum sensitivity and a high signal-to-noise ratio for outstanding reception of weak and distant signals. A manual RF gain control prevents overloading by strong signals. An antenna trimmer, adjustable from the front panel, permits peaking of the RF stage to compensate for loading effects of various antennas.

Outstanding frequency stability is achieved by the use of: 1) ceramic trimmers and coil forms in the first-conversion oscillator, 2) extensive temperature compensation, 3) voltage regulation of oscillators, and 4) a crystal-controlled, second-conversion oscillator.

Tuning is accomplished by a precision tuning mechanism to insure close calibration and accurate resettability. Smooth flywheel tuning affords maximum traverse speed and operating ease.

Provisions have been incorporated to accept, as an accessory, a 100-KC Crystal Calibrator, Model HA-7. This crystal calibrator provides marker signals at every 100 KC on the dial for checking calibration accuracy.

An automatic series noise limiter circuit, controlled by a switch on the front panel, reduces interference from electrical equipment, ignition noise, and other forms of pulse-type noise.

An *S meter* is used to indicate the accuracy of tuning and the relative strength of received signals. The meter is calibrated in S units from 1 to 9, and in decibels above S9.

Provision has been made in the receiver for a remote receive-standby control.

Audio output connections include terminals for a 3.2-ohm speaker. A front-panel jack is also provided for using headphones and the speaker is automatically silenced when the headphone plug is inserted.

The receiver is designed to operate on 105 to 125 volt, 50/60 cycle, AC current.

SECTION II
INSTALLATION

2-1. UNPACKING.

After unpacking the receiver, examine it closely for damage which may have occurred in transit. Should any sign of damage be apparent, immediately file a claim with the carrier stating the extent of damage. Carefully check all shipping labels and tags for instructions before removing or destroying them.

2-2. LOCATION.

The receiver may be placed in any location that will permit free air circulation through the ventilation holes and openings in the cabinet. Avoid excessively warm locations such as those near radiators and heating vents. The external speaker may be located in any convenient position, although it is recommended that it not be placed on top of the receiver for reasons of ventilation.

2-3. ANTENNAS.

The RF input of the receiver is designed for operation from either a single-wire antenna, a half-wave doublet, or other antenna with a transmission-line impedance from 50 to 600 ohms. Antenna connections are made to a three-terminal strip at the rear of the receiver marked A1, A2, and GND. Mounting holes are also provided, adjacent to the antenna terminals, for installation of an AN type SO-239 connector for coaxial-cable installations.

A. SINGLE-WIRE ANTENNA

The simplest antenna that will provide satisfactory results throughout the entire tuning range is a conventional single-wire antenna. In most localities, good results can be obtained with just the 15-foot length of antenna wire supplied with the receiver. (See figure 2.) Attach one end of the wire to terminal A1, connect the jumper link between terminals A2 and GND, and then extend the wire about the room in a convenient manner. If the receiver is operated in a steel-constructed building or where receiving conditions are exceptionally poor, an outside antenna, 50 to 100 feet long, may be necessary. The outside antenna should be erected as high as possible and kept free from surrounding objects.

In some locations, reception may be improved by connecting a ground wire (ordinary copper wire) from terminal GND to a cold-water pipe or outside ground rod. While the use of an outside ground rod installed in accordance with Insurance Underwriter's Laboratories requirements is adequate

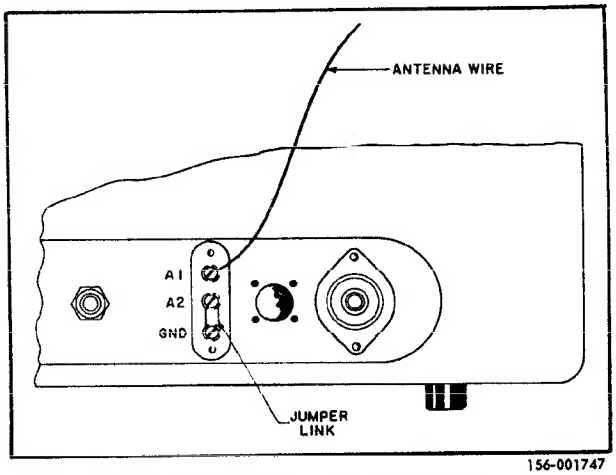

Figure 2. Single Wire Antenna Installation.

protection against lightning, it is strongly recommended that an additional connection be made to the nearest cold-water pipe to eliminate any shock hazard.

B. HALF-WAVE DOUBLET ANTENNA

For top performance, especially on the short-wave bands, the use of a half-wave doublet or other type of antenna employing a 50 to 600 ohm transmission line is recommended. A typical doublet antenna installation is shown in figure 3. The doublet antenna should be cut to the proper length for the most used frequency or band of frequencies. The formula for determining the overall length in feet of a doublet antenna is included in figure 3.

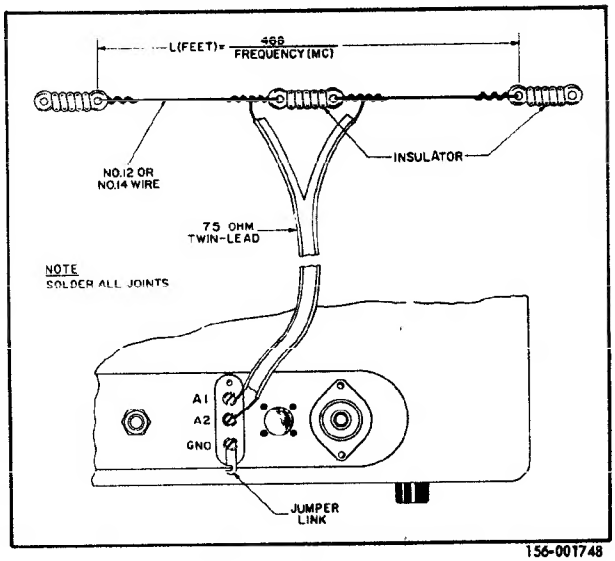

Figure 3. Typical Doublet Antenna Installation.

The doublet antenna is directional and should be erected with its entire length facing a desired station for maximum signal pickup.

The doublet antenna may be fed with either a balanced or unbalanced transmission line. When a balanced line such as *twin-lead* or *twisted pair* is used, the line connects to terminals A1 and A2 and the jumper link between A2 and GND is disconnected. (See figure 3.) When using an unbalanced line such as coaxial cable, the inner conductor connects to terminal A1, the outer braid connects to terminal A2, and the jumper link is connected between terminals A2 and GND. A ground wire may improve reception when using an unbalanced-type line.

The doublet antenna provides optimum performance only at or near the frequency for which it is cut. Therefore it may be desirable, for reception on frequencies remote from the antenna frequency, to utilize the doublet antenna as a single-wire type. This is accomplished by connecting the two transmission-line leads together and connecting them to terminal A1. The jumper link in this case should be connected between terminals A2 and GND.

In an installation where the receiver is used in conjunction with a transmitter, it may be advantageous to use the same antenna for receiving as for transmitting. This is especially true when a directional antenna is used, since the directive effects and power gain of the transmitting antenna are the same for receiving as for transmitting. Switching the antenna from the transmitter to the receiver may be accomplished with an antenna-changeover relay or a knife switch connected in the antenna leads.

For further information regarding antennas, refer to the *Radio Amateur's Handbook* or the A.R.R.L. *Antenna Book*, both published by the American Radio Relay League, West Hartford, Connecticut, U.S.A.

2-4. POWER SOURCE.

The receiver is designed to operate directly on 105 to 125 volt, 50/60 cycle AC current. Insert the power cord into any convenient AC power outlet of the proper rating. If in doubt about your power source, contact your local power company before connecting power to your receiver. The wrong power source can cause serious damage.

2-5. SPEAKER.

A three-terminal strip, marked GND, STDBY, and 3.2SPKR, is provided at the rear of the receiver for connecting the external speaker that is required with the receiver. (See figure 4.) Any permanent-magnet speaker with a 3.2-ohm voice coil can be used by simply connecting the two leads from the speaker voice coil to the terminals marked 3.2SPKR and GND.

Hallicrafters' Model R-48A Speaker is designed for use with this receiver and may be connected to the terminals marked 3.2SPKR and GND.

2-6. HEADPHONES.

The headphone jack, marked PHONES, is located on the front panel of the receiver and is wired so that the speaker is automatically silenced when the headphones are plugged in. The headphone impedance is not critical and any headphones ranging from 50 ohms to 5000 ohms will provide satisfactory performance.

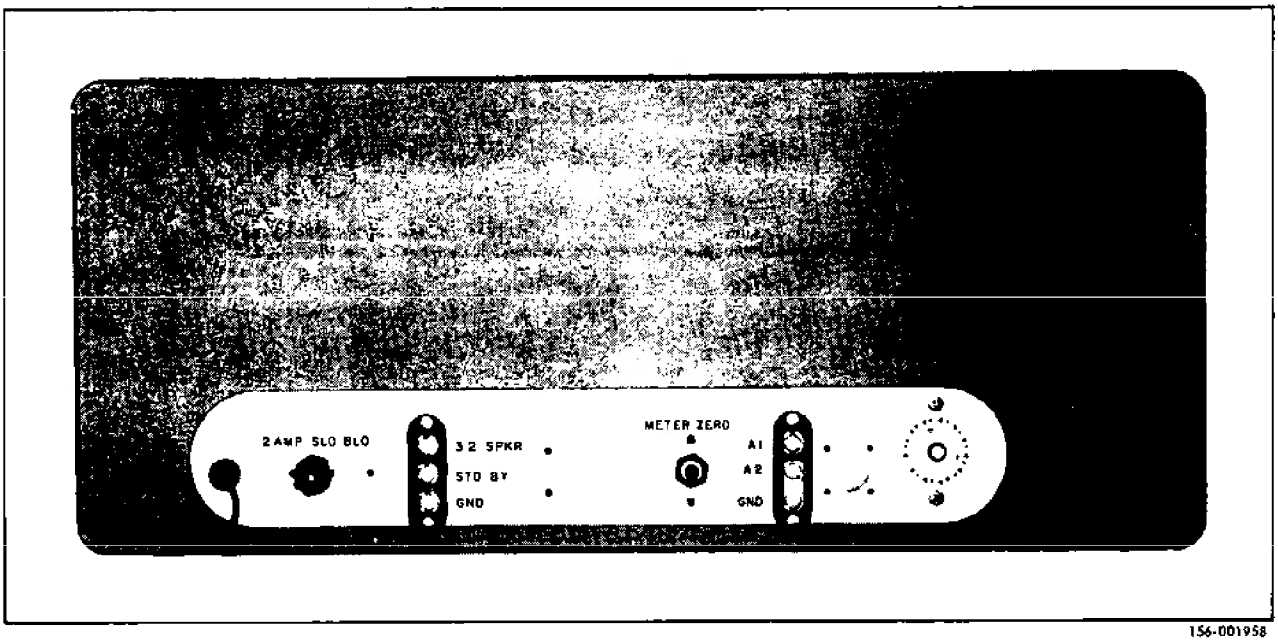

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Figure 4. Rear View of Receiver.

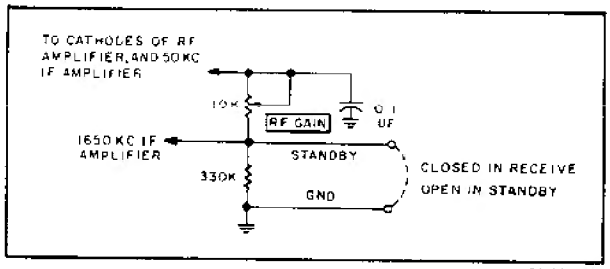


Figure 5. Remote Receive-Standby Circuitry.

2-7 REMOTE RECEIVE-STANDBY SWITCH.

The receiver may be disabled from a remote location by connecting a remote SPST switch or relay between the STDBY and GND terminals located at the rear of the receiver. (See figure 5.) To operate the receiver with the remote switch, the jumper link must be removed. The switch or relay should be so wired that the contacts will be closed in Receive and open in Standby.

SECTION III
FUNCTIONS OF OPERATING CONTROLS

3-1 GENERAL.

The controls discussed in this section are identified in figure 6. Before operating your receiver take time to familiarize yourself with these controls, their positions on the panel, and their functions.

3-2. RF GAIN.

The RF GAIN control varies the gain of the RF amplifier and 50-KC IF amplifier stages. Maximum sensitivity is obtained with the control set at 10 (fully clockwise). In this position, the tubes being controlled are operated at maximum gain with minimum cathode bias. As the control is rotated counterclockwise, the bias on the tubes increases with a resultant decrease in gain.

3-3. BAND SELECTOR.

The BAND SELECTOR control operates the band switch to place the proper set of coils into the circuit to cover the desired frequency range. The frequency range covered by each position of the BAND SELECTOR control is indicated directly on the panel.

3-4. ANTENNA TRIMMER.

The ANTENNA trimmer control operates a variable capacitor connected across the secondary of the antenna coil in use. This capacitor adjustment compensates for the loading effects of various types of antennas.

It should be noted that the ANTENNA trimmer peak will appear broad as the receiver is tuned towards the low-frequency end of the dial and may not give a definite peak. This is a normal condition and does not indicate improper alignment.

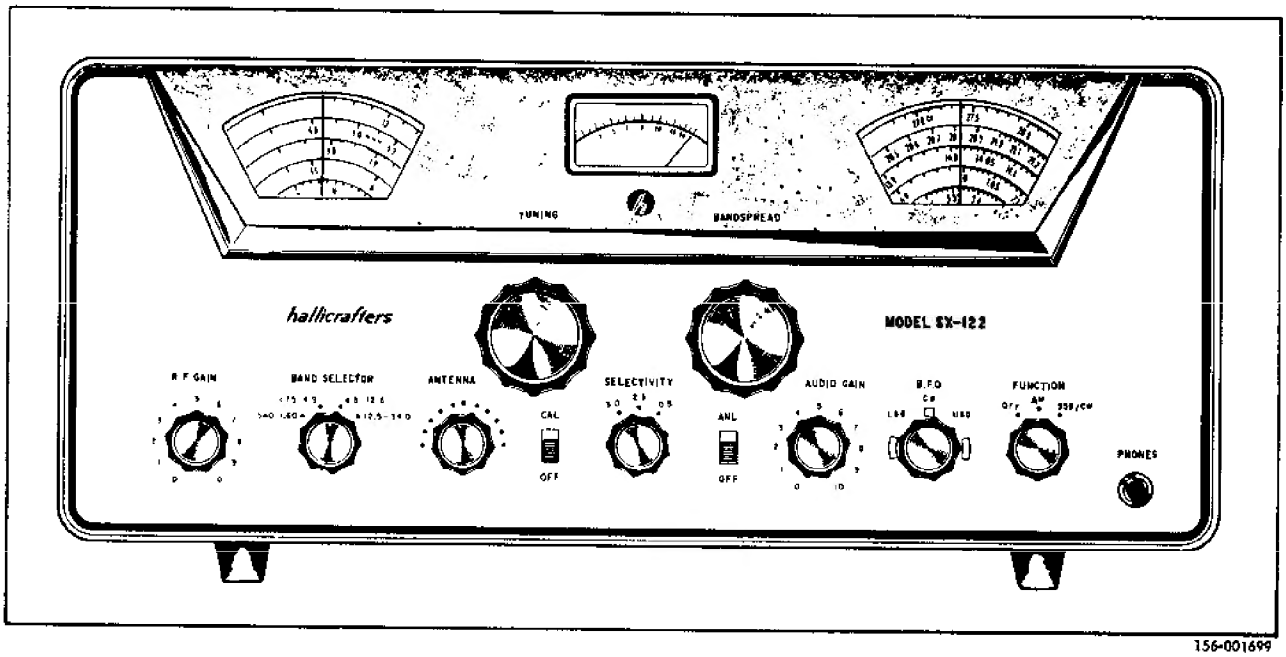


Figure 6. Front Panel Controls.

3-5. AUDIO GAIN.

The AUDIO GAIN control adjusts the audio level at the speaker terminals and PHONES jack. Clockwise rotation of the control increases the signal applied to the grid of the audio amplifier tube, thus increasing receiver volume; counterclockwise rotation decreases volume.

3-6. NOISE LIMITER (ANL-OFF).

The ANL-OFF switch, when set at ANL, places the automatic series noise limiter circuit in operation to reduce pulse-type noise such as ignition noise and electrical interference. The limiter circuit allows the signal to pass unaffected through the receiver, but makes the receiver inoperative for noise amplitudes greater than those of the signal. It will work on AM signals only and is self-adjusting (i.e., it automatically adjusts itself to the signal level).

The noise limiter circuit *chops* noise peaks received at the detector by means of a biased diode which becomes non-conducting above a predetermined signal level. When the limiter circuit is in operation, the audio output of the detector must pass through the limiter diode to the grid of the audio amplifier. The limiter diode normally acts as a conductor for the audio signal as long as the anode is positive with respect to its cathode. When a noise peak is higher in amplitude than the signal, it instantaneously swings the cathode positive with respect to the anode, conduction ceases, and that portion of the signal is automatically cut off from the audio amplifier.

3-7. FUNCTION.

The FUNCTION switch performs the following functions:

1. Operates the AC ON/OFF switch.
2. Connects the AM detector to the audio amplifier and disables the BFO.
3. Connects the product detector to the audio amplifier, energizes the BFO and switches in the slow release AVC components.

3-8. SELECTIVITY.

The SELECTIVITY control is used to vary the selectivity of the receiver to fit receiving conditions. Three degrees of selectivity are available: 0.5 KC for CW reception under crowded-band conditions, 2.5 KC for SSB, and 5 KC for maximum fidelity during AM reception. The three selectivity positions are shown on the front panel adjacent to the SELECTIVITY control and indicate receiver selectivity at 6 DB down.

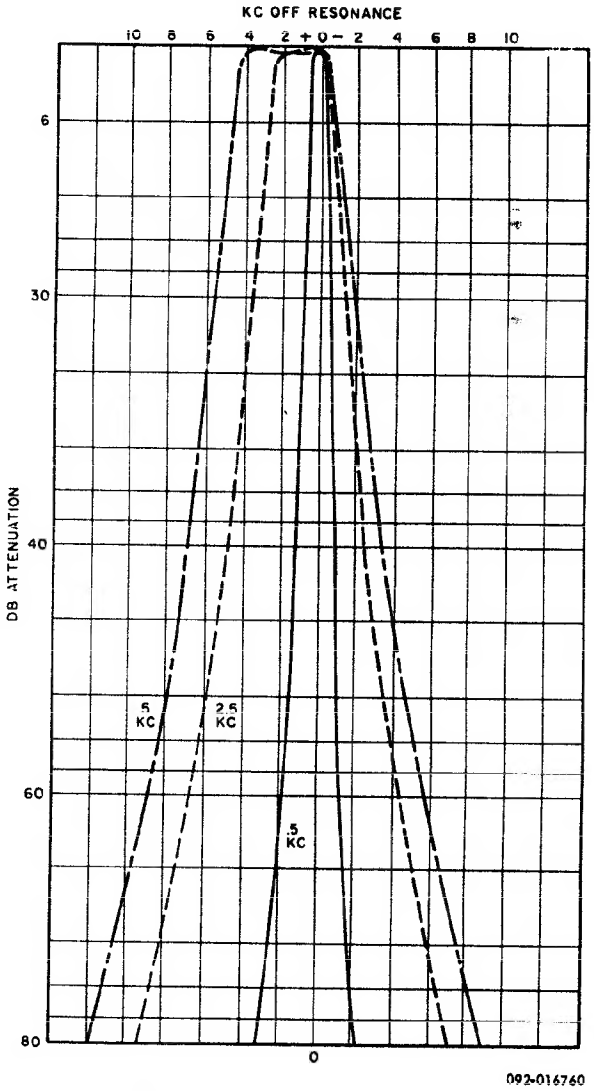


Figure 7. IF Selectivity Curves.

The receiver IF selectivity curves are shown in figure 7. Note that as the selectivity is varied from a sharp to a broader position, the IF passband not only increases but also shifts to a slightly higher frequency.

It should be noted that two meter peaks will appear when tuning a signal with the SELECTIVITY control in the 5 (KC) position. The signal should be tuned in with the SELECTIVITY at 2.5 (KC) and then switched to the 5 (KC) position if desired.

For broadcast reception, the SELECTIVITY control is normally set at 5, the position affording broadest selectivity. Selectivity may be progressively increased by turning the control to the positions marked 2.5 and 0.5. For reception of the crowded short-wave bands, it is generally advisable to sacrifice fidelity for greater selectivity, since the added selectivity reduces both adjacent-channel interference and background noise by attenuating

the higher audio frequencies. Too much selectivity on AM signals, however, will attenuate the high audio frequencies to such an extent that the signal may become unintelligible as a result of excessive sideband cutting. When receiving CW signals, the sharpest selectivity position (0.5) may be used without the loss of intelligibility experienced in AM reception.

3-9. BEAT FREQUENCY OSCILLATOR (BFO).

The BFO is an inductively-tuned oscillator which re-inserts the carrier at the product detector for SSB or CW reception. The center frequency of the BFO is 50.85 KC and is variable over a range of ±2 KC.

Placing the BFO frequency on the high-frequency slope of the IF passband allows frequencies below the BFO frequency to be accepted through the IF passband (lower-sideband reception).

Placing the BFO frequency on the low-frequency slope of the IF passband allows frequencies higher than the BFO frequency to be accepted through the IF passband (upper-sideband reception).

The correct settings for USB, LSB, and CW are shown on the panel. It should be noted that changing the BFO setting will affect receiver tuning. Therefore, the bandspread dial should be calibrated with the BFO control preset to the desired position.

The BFO control makes an excellent *fine tuning* control and will be found very useful as such for both CW and SSB reception under crowded conditions.

3-10. CALIBRATE (CAL-OFF).

The CAL-OFF switch controls the operation of the optional Model HA-7 Crystal Calibrator. When the switch is set at CAL, the crystal calibrator is turned on to provide marker signals at every 100 KC on the dial. The crystal calibrator employs a crystal-controlled, pentode oscillator circuit. The output of the crystal calibrator is capacitively coupled to the antenna input circuit. A trimmer capacitor, adjustable by the *Crystal Adj.* control on the top of the calibrator unit, permits adjustment of the calibrating crystal to exactly 100 KC by comparison with the frequencies transmitted by WWV. This capacitor has been set at the factory and normally should not require readjustment unless extreme calibration accuracy is required. If adjustment is required, proceed as outlined in paragraph 4-7.

NOTE

If the HA-7 calibrator is not used, the CAL-OFF switch should be left in the OFF position at all times.

3-11. TUNING AND BANDSPREAD.

The TUNING and BANDSPREAD controls are used in conjunction with one another to tune-in the desired signal. *Coarse tuning* is performed with the TUNING control and *fine tuning* with the BANDSPREAD control.

A. MAIN TUNING DIAL

The main-tuning or left-hand dial is operated by the TUNING control. This dial has five calibrated scales, one for each of the four frequency bands plus a logging scale. For normal tuning, the main-tuning dial is set for the desired station frequency after the BANDSPREAD control has been positioned at the *Bandspread Set* line.

IMPORTANT

The readings on the main tuning dial will correspond to the station frequencies only if the BANDSPREAD control is set at the *Bandspread Set* line. If it is set at any other position, the additional bandspread capacity added to the main tuning capacity will mis-calibrate the main tuning dial.

The dial settings for the 80, 40, 20, 15, and 10 meter band, which includes the citizens band (26.965 to 27.255 MC), are indicated on the main tuning dial by small circle dots. When tuning with the bandspread dial, the main-tuning dial must be set at the dot corresponding to the desired band. International short-wave broadcast bands are indicated by a double line and identified in meters.

B. BANDSPREAD DIAL

The bandspread or right-hand dial is operated by the BANDSPREAD control. This dial contains five scales calibrated for the 80, 40, 20, 15, 10 meter and citizens bands. These five scales are calibrated to read receiver frequency directly when the main-tuning dial has been set to the index dot of the desired band. For convenience in tuning, the amateur bands are indicated on the bandspread dial by double weight lines and the phone bands are indicated by triple-weight lines.

NOTE

Use 10-meter dot for citizens-band calibration.

The bandspread dial may also be utilized as a *fine tuning* adjustment over any portion of the receiver tuning range. Two methods of fine tuning are described on the next page.

a. The first method of fine tuning is used when it is desired to tune in a single signal with precision accuracy. First the BANDSPREAD control is set a few degrees from its *Bandspread Set* position, the desired signal is located with the TUNING control, and then the signal is accurately tuned in by *rocking* the BANDSPREAD control (turning it slightly to the left and right) until the signal is loudest and clearest.

b. The second method of fine tuning is used when it is desired to tune through a range of frequencies, such as a group of short-wave stations. Set the BANDSPREAD control fully counterclockwise, set the TUNING control for the high end of the selected range of frequencies, and then tune through the range with the BANDSPREAD control. Turning the BANDSPREAD control clockwise tunes the receiver progressively lower in frequency.

SECTION IV
OPERATION

4-1. AM RECEPTION.

1. Set the front panel controls to their starting positions as outlined below.

RF GAIN . . . . . *10 (maximum sensitivity).*

BAND SELECTOR . . . . . *At the desired band.*

AUDIO GAIN. . . . . *2.*

ANTENNA . . . . . *Peak on signal.*

ANL–OFF . . . . . OFF.

FUNCTION . . . . . OFF.

SELECTIVITY . . . . . *2.5 or 5.*

CAL–OFF . . . . . OFF.

2. Turn the receiver on by rotating the FUNCTION control clockwise to AM. The tuning dials will light up, indicating the receiver is operative. Rotate the AUDIO GAIN control clockwise for the desired volume level.

3. Set the bandspread-tuning gang near minimum capacity by rotating the BANDSPREAD control to *Bandspread Set*. To utilize the BANDSPREAD control as a *fine tuning* adjustment for the short-wave bands, refer to paragraph 3-11.

IMPORTANT

The calibration on the main-tuning (left-hand) dial will be correct only if the bandspread-tuning gang is set at *Bandspread Set*. If it is set at any other position, the additional bandspread capacity added to the main-tuning capacity will mis-calibrate the main-tuning dial.

4. Tune to the desired signal with the TUNING control, tuning for maximum clarity. After the signal has been accurately tuned in, readjust the AUDIO GAIN control as desired.

NOTE

The *S meter* will not give a true indication of the IF selectivity because the AVC bandwidth is approximately twice as wide as the signal bandwidth at the detector.

When tuning an AM signal, it will be found convenient to tune the signal with the SELECTIVITY set at 2.5 and then turn the SELECTIVITY control to 5 after tuning in the station.

5. Set the SELECTIVITY control for the desired degree of selectivity. For standard-broadcast reception (Band 1), the control is normally set to 5 for maximum fidelity. The positions marked 2.5 and 0.5 provide progressively increasing steps of selectivity. Note that as the selectivity of the receiver is increased, the background noise and interference from adjacent signals is reduced. Too much selectivity, however, may cause excessive sideband cutting. While sideband cutting reduces fidelity, it may frequently be preferable to sacrifice naturalness of reproduction in favor of communications effectiveness. When changing the position of the SELECTIVITY control from a broad to a narrower response, a slight readjustment of the tuning controls may be necessary to center the signal in the IF passband.

6. Use ANL (noise limiter) as noise conditions dictate.

4-2. EXALTED CARRIER AM RECEPTION.

In short-wave reception, transmission conditions frequently are different for waves of slightly different frequencies. In voice modulated transmissions (particularly AM), which involve sideband frequencies differing slightly from the carrier frequency, the carrier and sideband components may not be received in the same relative amplitudes and phases that were present at the transmitter. This effect, known as selective fading, causes severe distortion of the signal.

Selective fading can be reduced considerably by utilizing the selectable-sideband feature of the Model SX-122 Receiver operating in an exalted carrier mode (i.e., the transmitted carrier is positioned out of the receiver's IF passband along with one sideband, producing a suppressed carrier single-sideband signal). The carrier is subsequently re-inserted by the receiver's BFO and the signal is detected in the same manner as a single-sideband signal.

Controls should be set as for SSB reception. Either USB or LSB may be used.

4-3. SINGLE-SIDEBAND RECEPTION.

1. Set the front panel controls to their starting positions as follows:

RF GAIN . . . . . 10 *(maximum sensitivity).*

BAND SELECTOR . . . . . *At desired band.*

AUDIO GAIN . . . . . *Approximately 2.*

FUNCTION . . . . . SSB/CW.

BFO . . . . . *Usually LSB for 40 and 80 meters USB for 20, 15, and 10 meters.*

SELECTIVITY . . . . . 2.5.

ANTENNA . . . . . *Peak on signal.*

TUNING . . . . . *Set at desired index dot if tuning amateur band.*

BANDSPREAD . . . . . *As desired.*

Slowly tune into the signal until the voice modulation sounds natural and adjust the *Audio Gain* control for desired volume.

It should be remembered that an SSB signal will convey intelligence only when the correct sideband position has been selected by the BFO control. If the signal does not tune properly, move the BFO control to the opposite sideband position and retune the receiver.

Under certain conditions, it may be found advantageous to reduce the RF GAIN setting for improved reception. It should be remembered that this will reduce AVC and also affect the *S meter* reading.

4-4. CW RECEPTION.

Set all controls as shown in single-sideband reception except for the BFO control which should be set to the CW position.

Under crowded-band conditions, it may be found desirable to set the SELECTIVITY switch to the 0.5 position for improved selectivity.

4-5. USE OF CRYSTAL CALIBRATOR.

The optional Model HA-7 100-KC Crystal Calibrator permits accurate checking of the dial calibration over any portion of the main and bandspread tuning dials by comparing the dial calibrations with the marker signals which appear at every multiple of 100 KC on the dial.

A. CALIBRATION OF THE BANDSPREAD DIAL

1. Set the bandspread-tuning dial at a convenient multiple of 100 KC at the high-frequency end of the band in use. For example: 4000 KC on 80 meters, 7300 KC on 40 meters, 14,300 KC on 20 meters, 21,400 KC on 15 meters, and 29,700 KC on 10 meters.
2. Set the main-tuning dial to the index dot of the desired band.
3. Set the FUNCTION switch to SSB/CW, the BFO switch to CW, and the CAL-OFF switch to CAL.
4. Very carefully adjust the TUNING control for the exact frequency as indicated by *zero beat*. The bandspread-tuning dial is now accurately calibrated and a *zero beat* should be obtained at every multiple of 100 KC on the band in use. For example, on the 80-meter band, a *zero beat* should be obtained at or close to 3500, 3600, 3700, 3800, 3900, and 4000 KC.
5. The procedure outlined in Steps 1 through 4 above provides average calibration accuracy over the entire frequency range of the band in use. For precise calibration accuracy over a particular section of the band, the procedure is identical except that the bandspread dial is set at a multiple of 100 KC near the desired frequency or range of frequencies, instead of at the high end of the band as in Step 1.

B. CALIBRATION OF THE MAIN TUNING DIAL

1. Turn the BANDSPREAD control counterclockwise until the dial pointer is aligned with the index marks at the high-frequency end of the dial (*Bandspread-Set* line).
2. Set the main-tuning dial at a convenient multiple of 100 KC near the desired frequency or range of frequencies. (The main-tuning dial is calibrated in MC.) To determine the nearest 100 KC multiple, simply remember that 100 KC is equal to 0.1 MC. For example, from 2.0 to 3.0 MC on band 2, the 100-KC multiples are 2.0 MC, 2.1 MC, 2.2 MC, 2.3 MC, etc.

3. Set the FUNCTION switch to SSB/CW. Then set the CAL-OFF switch to CAL . If a *zero beat* does not occur at the 100-KC check point, turn the BANDSPREAD control clockwise or counterclockwise as necessary to establish Main-Tuning dial calibration.

4-6. USE OF THE S METER.

The *S meter* provides a visual means of determining whether or not the receiver is properly tuned, as well as an indication of the relative signal strength. The *S meter* circuit consists of a DC milliammeter connected in series with the cathode lead to the 1650-KC IF amplifier tube, the grid of which is controlled by AVC voltage. Since the cathode current of this tube varies with the strength of the incoming signal, the meter will indicate relative signal strength. The *S meter* is calibrated in S units from 1 to 9 and in decibels above S-9. The indications on the *S meter* will be correct only when the RF GAIN control is set at 10 (maximum sensitivity).

NOTE

If the RF GAIN control is set at a reduced position, the *S meter* may read below zero under no signal conditions. This is a normal condition.

4-7. CRYSTAL CALIBRATOR CHECK.

The *Crystal Adj.* control on the optional Model HA-7 Calibrator chassis operates a trimmer capacitor connected across the 100-KC calibrating crystal. This trimmer capacitor permits adjustment of the calibrating crystal at exactly 100 KC by comparison with the frequencies transmitted by station WWV. This capacitor has been set at the factory and should not require readjustment unless extreme calibration accuracy is desired. If adjustment is required, proceed as follows:

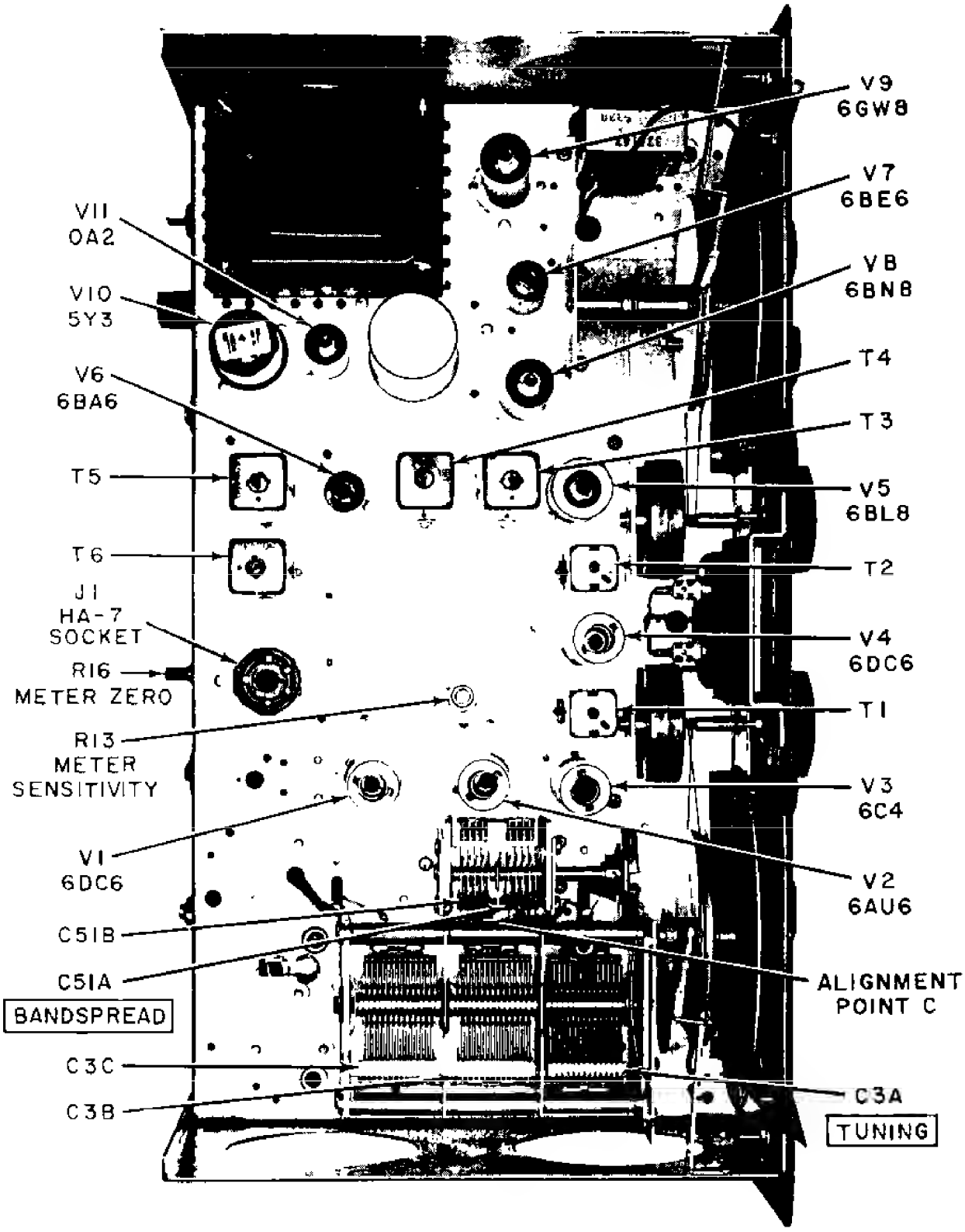
Set the FUNCTION switch to AM, the CAL-OFF switch to OFF, and all other front-panel controls for normal AM reception. Tune in station WWV on any one of its operating frequencies (2.5, 5, 10, 15, 20, or 25 MC) and wait for the period during which the signal from WWV is unmodulated. Then switch on the crystal calibrator by setting the CAL-OFF switch to CAL and adjust its frequency, by means of the *Crystal Adj.* control, until the crystal calibrator signal *zero beats* with the signal received from WWV. If the adjustment is attempted during periods that WWV is modulated, an erroneous *zero beat* may be obtained with the modulating frequency instead of the desired carrier frequency.

4-8. OPERATING AND SERVICE QUESTIONS.

For further information regarding operation or servicing of this equipment, contact the dealer from whom the unit was purchased. The Hallicrafters Company maintains an extensive system of Authorized Service Centers where any required service will be performed promptly and efficiently at no charge if this equipment is delivered to the service center within 90 days from date of purchase by the original buyer and the defect falls within the terms of the warranty. It is necessary to present the Bill-of-Sale in order to establish warranty status. After the expiration of the warranty, repairs will be made for a nominal charge. All Hallicrafters Authorized Service Centers display the sign shown below. For the location of the one nearest you, consult your dealer or your local telephone directory.

Make no service shipments to the factory unless instructed to do so by letter, as The Hallicrafters Company will not accept responsibility for unauthorized shipments.

The Hallicrafters Company reserves the privilege of making revisions in current production of equipment and assumes no obligation to incorporate such revisions in earlier models.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V7
6BE6
VII
0A2
VIO
5Y3
V8
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V6
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T4
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V5
6BL8
T6
T2
J I
HA-7
SOCKET
V4
6DC6
RI6
METER ZERO
TI
RI3
METER
SENSITIVITY
V3
6C4
VI
6DC6
V2
6AU6
C5IB
C5IA
BANDSPREAD
ALIGNMENT
POINT C
C3C
C3A
C3B
TUNING

SECTION V
ALIGNMENT

This receiver has been carefully aligned at the factory by specially-trained personnel using precision equipment. Alignment of the receiver should not be attempted until all other possible causes of faulty operation have been investigated. Alignment should not be required unless the receiver has been tampered with or component parts have been replaced in the RF or IF stages. Alignment should be performed only by persons familiar with communications receivers and experienced in their alignment. Refer to figures 8 and 9 for location of all alignment adjustments.

5-1. EQUIPMENT REQUIRED.

Signal generator covering 50 KC to 30 MC.

Vacuum tube voltmeter (VTVM) or other high-impedance DC voltmeter.

Output meter (or AC scale of VTVM). Connect output meter to appropriate speaker output terminals. If a VTVM is used, connect it to terminals 3.2 SPKR and GND and terminate the output with a dummy load.

5-2. INITIAL CONTROL SETTINGS.

Band Selector . . . . . *As indicated in chart.*

RF and AUDIO GAIN . . . . . *10 (maximum).*

ANL-OFF . . . . . OFF.

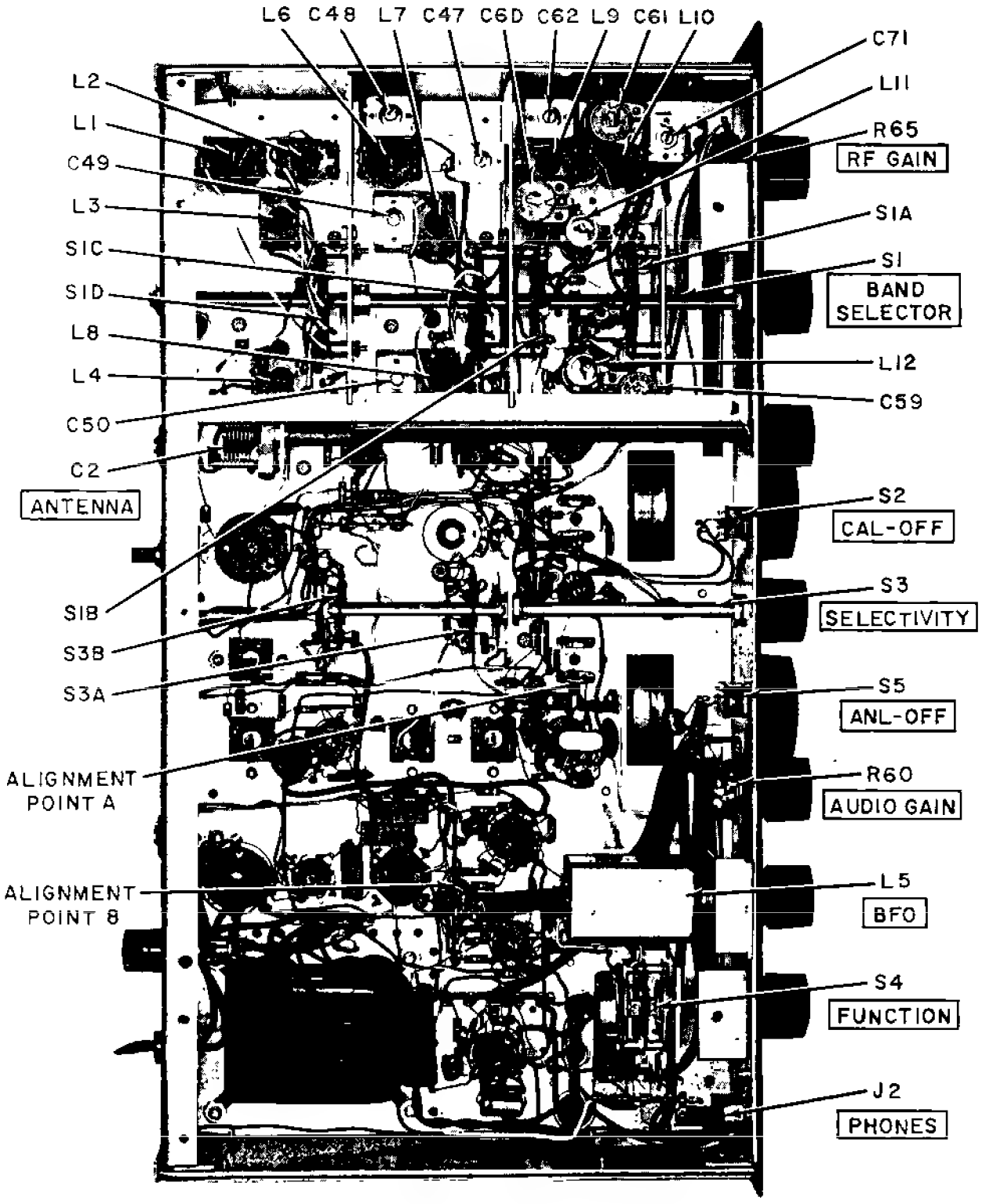
FUNCTION . . . . . AM.

Selectivity . . . . . *As indicated in chart.*

Tuning and Bandspread . . . . . *Gangs half meshed.*

5-3. ALIGNMENT PROCEDURE.

STEP	SIGNAL GENERATOR CONNECTIONS	SIGNAL GENERATOR FREQUENCY	BAND SELECTOR SETTING	OUTPUT CONNECTIONS	SELECTIVITY SETTING	REMARKS
			50-KC IF ALIGNMENT			
1	High side to alignment point A (terminal 2 of T2). Low side to chassis.	50 KC (unmod)	0.540 to 1.60 MC	VTVM DC probe to alignment point B (junction of R55, R56, and C84). Common to chassis.	0.5 KC	Remove first conversion oscillator tube V3 from its socket to prevent signal interference. Adjust top slug of T6, T5, T4, and T3 (50-KC IF's) for maximum indication, maintaining approximately one volt reading on VTVM.
			1650-KC IF ALIGNMENT			
2	High side to alignment point C (stator of section C3B of main tuning gang). Low side to frame of gang.	1650 KC (mod)	0.540 to 1.60 MC	Output meter across speaker terminals. (VTVM to alignment point B if it is desired to monitor detector voltage.)	5 KC	Replace tube removed in Step 1. Tune generator slowly through 1650 KC to determine IF passband. Then set generator to center of passband, using sufficient generator output to obtain approximately 1/2 watt receiver output and adjust the top and bottom slugs of T2 and T1 for maximum response. Tune through the passband and observe the shape of the response. If it is symmetrical, the adjustment is completed; if not, reset the generator frequency near the center of the passband and repeak T2 and T1.
			IF SENSITIVITY CHECK			
3	With the generator modulated 30% at 400 cycles and connected through a 0.05 μF capacitor to the grid (pin 1) of the first mixer tube V2, the IF input required for 1/2-watt receiver output should be approximately 15 microvolts (1650 KC).					



156-0019

Figure 9. Bottom Chassis View.

RF ALIGNMENT

Before proceeding with the RF alignment, check the tuning dials for proper indexing. Both dials should index on the marks at the low-frequency end with the gang fully closed.

Use an amplitude-modulated signal.

Set the RF and AUDIO GAIN to 10 (maximum), ANL - OFF to OFF, SELECTIVITY to 2.5, FUNCTION to AM, and BANDSPREAD at *Bandspread Set.*

Connect the output meter across the speaker terminals. (Connect the VTVM to alignment point B if it is desired to monitor the detector voltage.) Maintain a 1/2-watt receiver output.

Connect high side of generator through a 330-ohm carbon resistor to antenna terminal A1, low side to A2. Connect jumper between A2 and GND.

The oscillator frequency is higher than the signal frequency on all bands.

STEP	BAND SELECTOR SETTING	GENERATOR AND RECEIVER FREQUENCY	ADJUST FOR MAXIMUM
4	12.5 to 34 MC	30.0 MC	C59 (oscillator trimmer), C50 (mixer trimmer), and C2 (antenna trimmer)
	12.5 to 34 MC	14.0 MC	L12 (oscillator slug) L8 (mixer slug), and L4 (antenna slug)
5	4.8 to 12.6 MC	11.5 MC	C60 (oscillator trimmer), C49 (mixer trimmer), and C2 (antenna trimmer)
	4.8 to 12.6 MC	5.0 MC	L11 (oscillator slug), L7 (mixer slug), and L3 (antenna slug)
6	1.75 to 4.9 MC	4.6 MC	C61 (oscillator trimmer), C48 (mixer trimmer), and C2 (antenna trimmer)
	1.75 to 4.9 MC	2.0 MC	L10 (oscillator slug)
7	0.54 to 1.60 MC	1.4 MC	C62 (oscillator trimmer), C47 (mixer trimmer), and C2 (antenna trimmer)
	0.54 to 1.60 MC	0.6 MC	C71 (oscillator padder)

5-4. S METER CALIBRATION.

1. To adjust the *Meter Zero* the antenna should be disconnected and the receiver antenna terminals shorted; RF GAIN full on.

Adjust the *Meter Zero* potentiometer (R16) on the rear apron of the chassis until the meter pointer is directly over the last calibration mark on the left side of the meter scale. With this adjustment made, if the RF GAIN is rotated counter-clockwise, the meter may read below zero. This is normal.

NOTE

Allow at least one-half hour warmup time before making any adjustments.

2. To adjust the meter calibration, it will be necessary to have a signal generator that is accurately calibrated in microvolts output.

a. Set generator to 14.3 MC and 50 microvolts output.

b. Place SELECTIVITY switch to the 2.5 position, FUNCTION to AM and carefully tune receiver for maximum *S meter* deflection at 14.3 MC.

c. Peak ANTENNA trimmer (C2).

d. If the meter does not read S9, adjust *Meter Sensitivity* potentiometer (R13) near top center of chassis for S9 reading.

e. Recheck *Meter Zero* setting and repeat adjustments if necessary.

5-5. BFO CALIBRATION.

To check the BFO calibration, set the receiver controls for CW reception, SELECTIVITY to 0.5 and tune in an unmodulated signal for maximum *S meter* deflection. With the BFO control at mid rotation (CW position), the beat-note frequency should be between 700 and 1000 cycles and *zero beat* should occur with the control rotated approximately forty-five degrees clockwise from the center position.

If the control is far from its correct setting, it may be *roughed in* in the following manner.

1. Remove the BFO knob and the adapter bushing from the BFO tuning shaft.

2. Set receiver controls for CW reception, SELECTIVITY in the 2.5 position and tune receiver to clear frequency (no signal).

3. With screwdriver, run the BFO tuning shaft in or out as necessary to the point where the noise becomes lowest in audio pitch with a symmetrical rise in pitch in either direction from this point. With the shaft set at the point of lowest audio noise pitch, replace the shaft bushing with the long set screw straight up (vertical position).

4. Replace BFO knob with indicator line in CW position (mid rotation).

SECTION VI
SERVICE DATA

6-1. TECHNICAL SPECIFICATIONS.

FREQUENCY COVERAGE

BAND	FREQUENCY RANGE	CALIBRATED BANDSPREAD
1	0.540 to 1.60 MC	—
2	1.75 to 4.9 MC	80M
3	4.8 to 12.6 MC	40M
4	12.5 to 34.0 MC	20, 15, 10M, Citizens Band

TUBES

Nine plus voltage regulator and rectifier.

SPEAKER OUTPUT

3.2 ohms

HEADPHONE IMPEDANCE

50 to 5000 ohms.

ANTENNA INPUT IMPEDANCE

50 to 600 ohms.

POWER SOURCE

105 to 125 volts, 50/60 cycles.

POWER CONSUMPTION

85 watts.

RECEPTION

AM, CW, and SSB.

INTERMEDIATE FREQUENCIES

(Double Conversion): 50 KC and 1650 KC.

DIMENSIONS (overall) (HWD)

8 by 18-3/4 by 9-13/16 inches (HWD).

SHIPPING WEIGHT

32-1/2 pounds.

NET WEIGHT

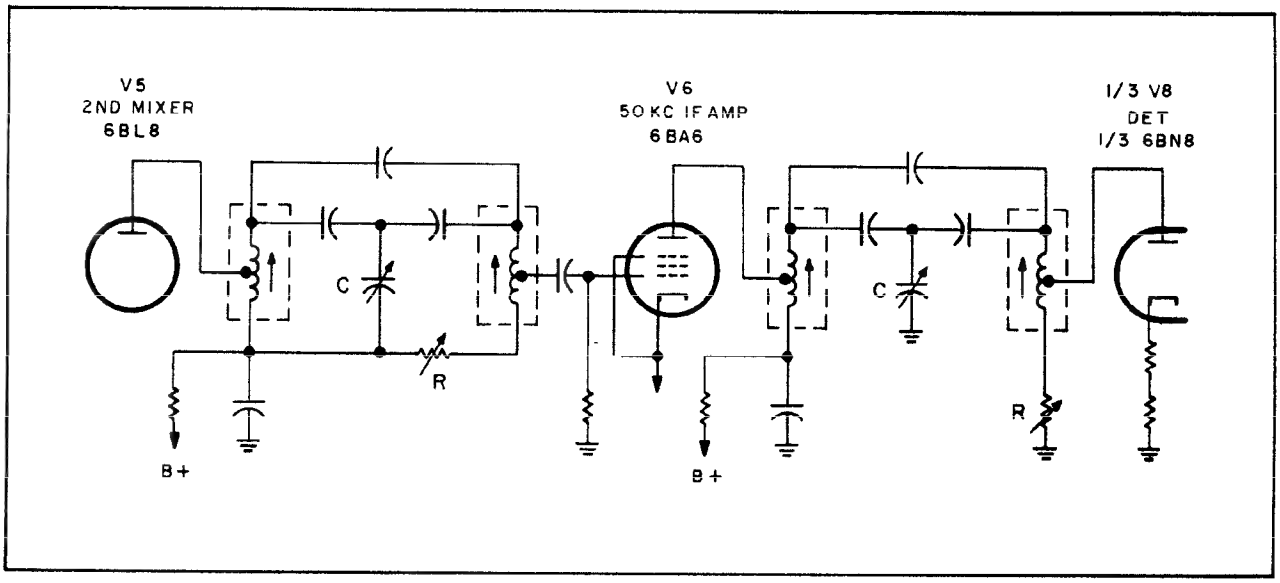
28-3/4 pounds.

6-2. 50-KC-IF SYSTEM.

Figure 10 shows the type of coupling used in the 50-KC IF system. Note that inductive coupling is avoided by careful shielding of the IF coils and signal transfer occurs only through capacity and resistance. By increasing the value of R (resistance) and decreasing C (capacity), the selectivity is made broader; while decreasing R and increasing C causes the selectivity to become sharper. The proper values of C and R are switched in the circuit by means of the SELECTIVITY control. R varies the Q of the tuned circuit and C varies the coupling. This R-C coupling arrangement affords a more accurate means of selectivity control than that readily obtainable by any other method.

6-3. CHASSIS REMOVAL.

Both the top and bottom covers can be removed for easy access to both sides of the chassis. To remove the chassis and panel assembly from the cabinet, remove the four outer bottom screws and slide chassis forward through front of cabinet.



156-001905

Figure 10. Equivalent Schematic Diagram of 50-KC IF System.

IMPORTANT

To remove the top cover, turn the four screws counterclockwise one quarter turn and lift cover. Do not attempt to remove these screws.

To remove the bottom cover, remove the four inner bottom screws.

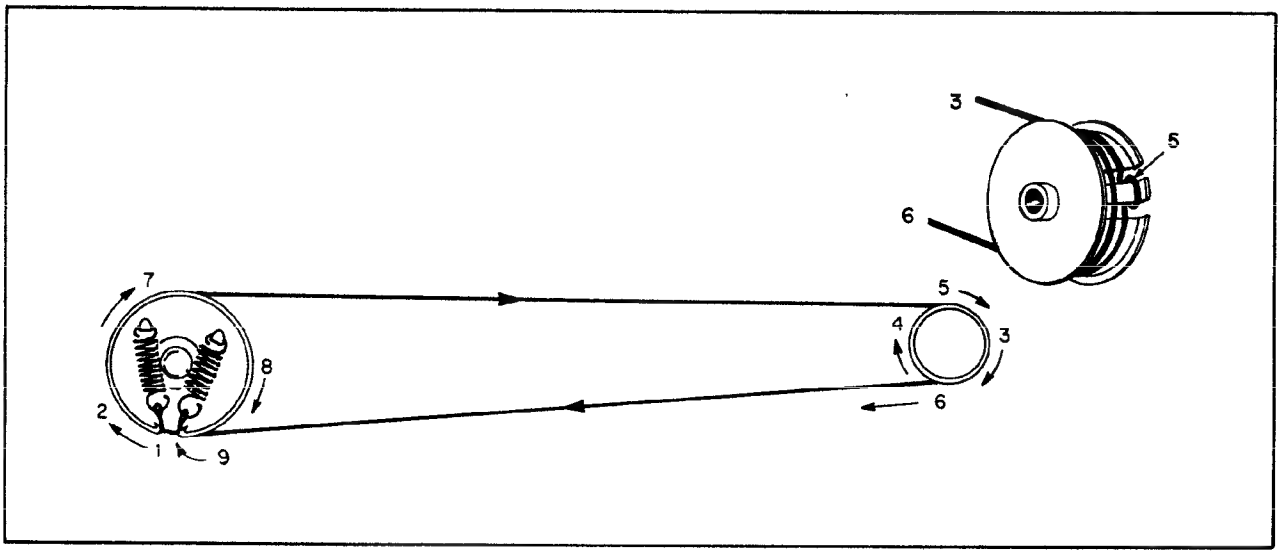
6-4. TUBE AND DIAL LAMP REPLACEMENT.

To gain access to the tubes and dial lamps, remove top cover (see IMPORTANT note above). See label on the inside rear of cabinet for tube location.

6-5. DIAL RESTRINGING.

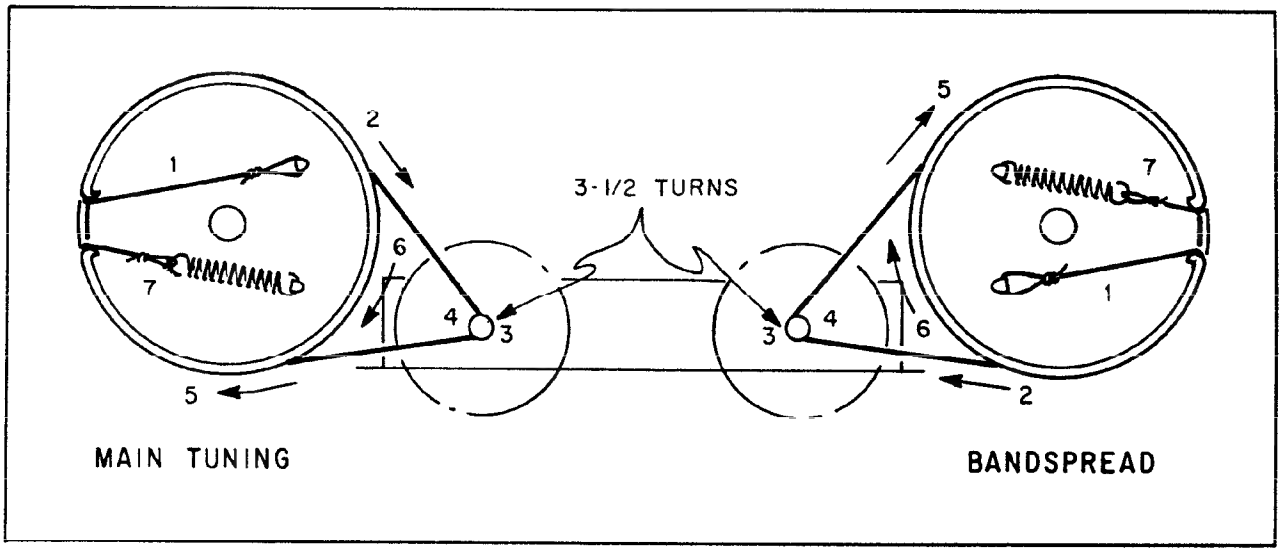
The bandspread gang restringing (figure 11) may be accomplished without removing any parts. Before starting, attach the tension springs to the cable, rotate the BANDSPREAD control knob fully clockwise, and set the bandspread gang in its closed position. Attach the spring at one end of the cable to position 1 on the pulley as shown in figure 11 and follow the stringing sequence 1 through 9.

After stringing, check to see if the dial scale lines up with the pointer when the bandspread gang is in its closed position. If the index marks on the scale do not line up, loosen the set screws holding the dial to the shaft and rotate to proper position.



156-001841

Figure 11. Restringing the Bandspread Gang.



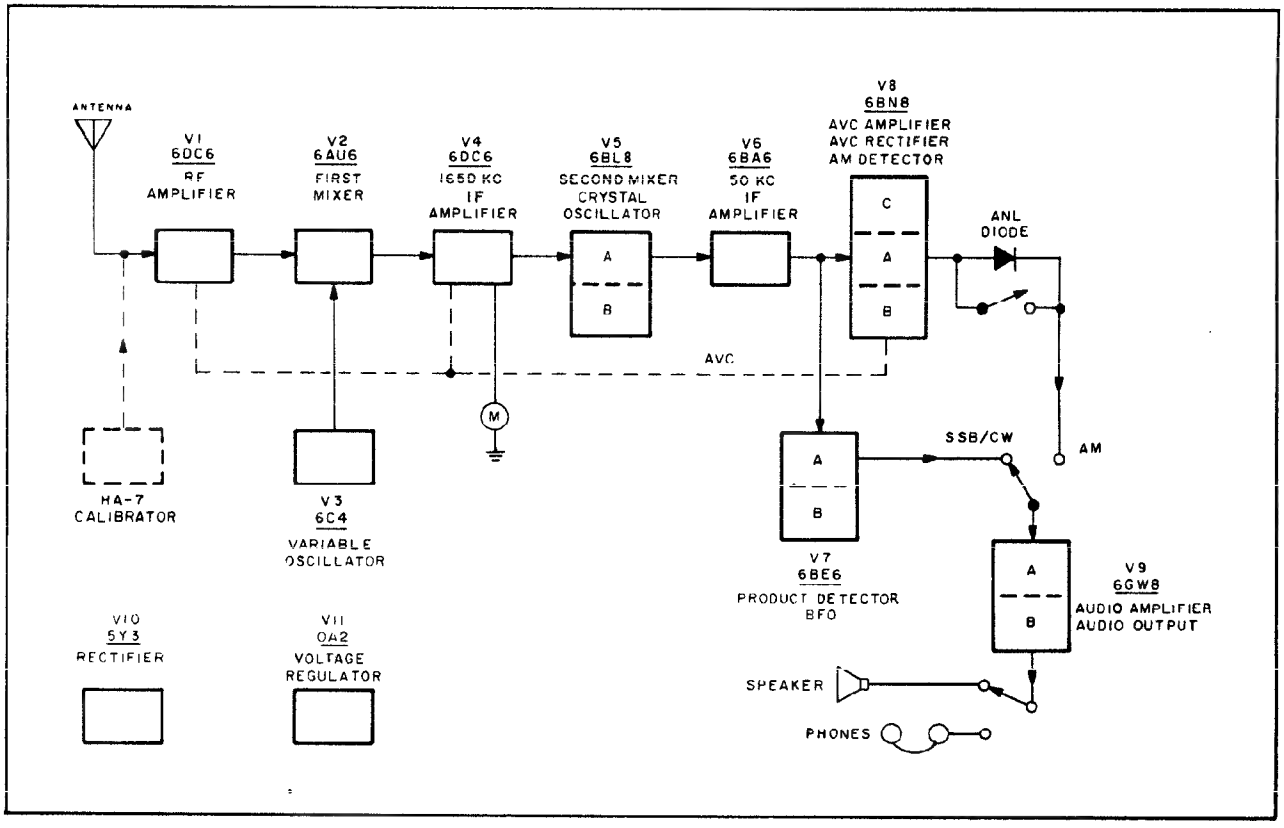
156-001840

Figure 12. Restringing the Main Tuning and Bandspread Dials.

In order to restring the dial drive of either the main tuning or bandspread dial, the front panel, pointer, and dial scale should be taken off for accessibility. In both drives the gang is set in its closed position. Attach the knotted end of the string to position 1 on the pulley as shown in figure 12 and follow the stringing sequence 1 through 7.

6-6. VOLTAGE AND RESISTANCE MEASUREMENTS.

The voltages normally present at the pins of the various tubes within this receiver are shown in figure 14. The resistances present at these same pins are shown in figure 15. To identify the tube elements by pin number, refer to figure 18, the schematic diagram.



156-001638

Figure 13. Block Diagram of the Model SX-122 Receiver.

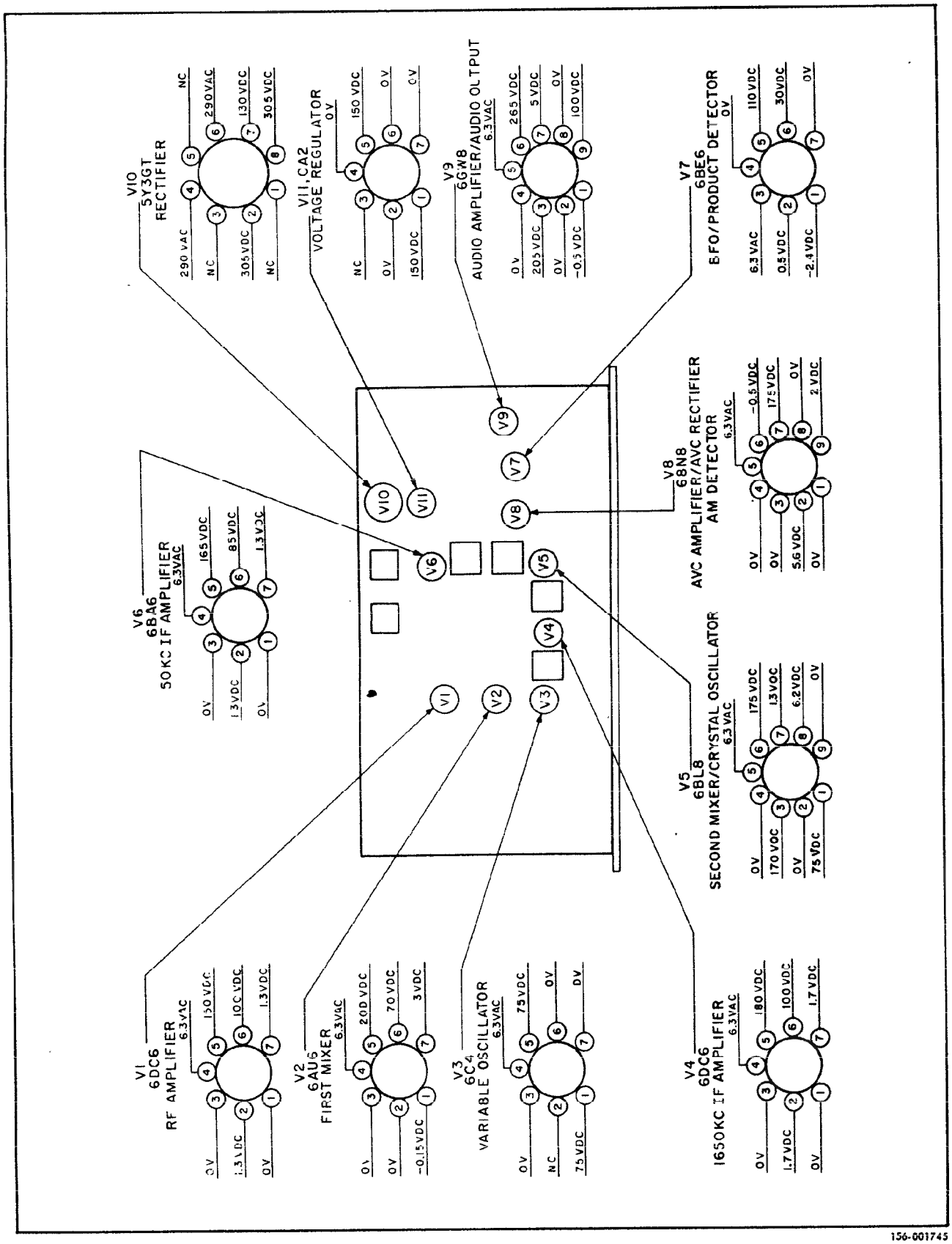
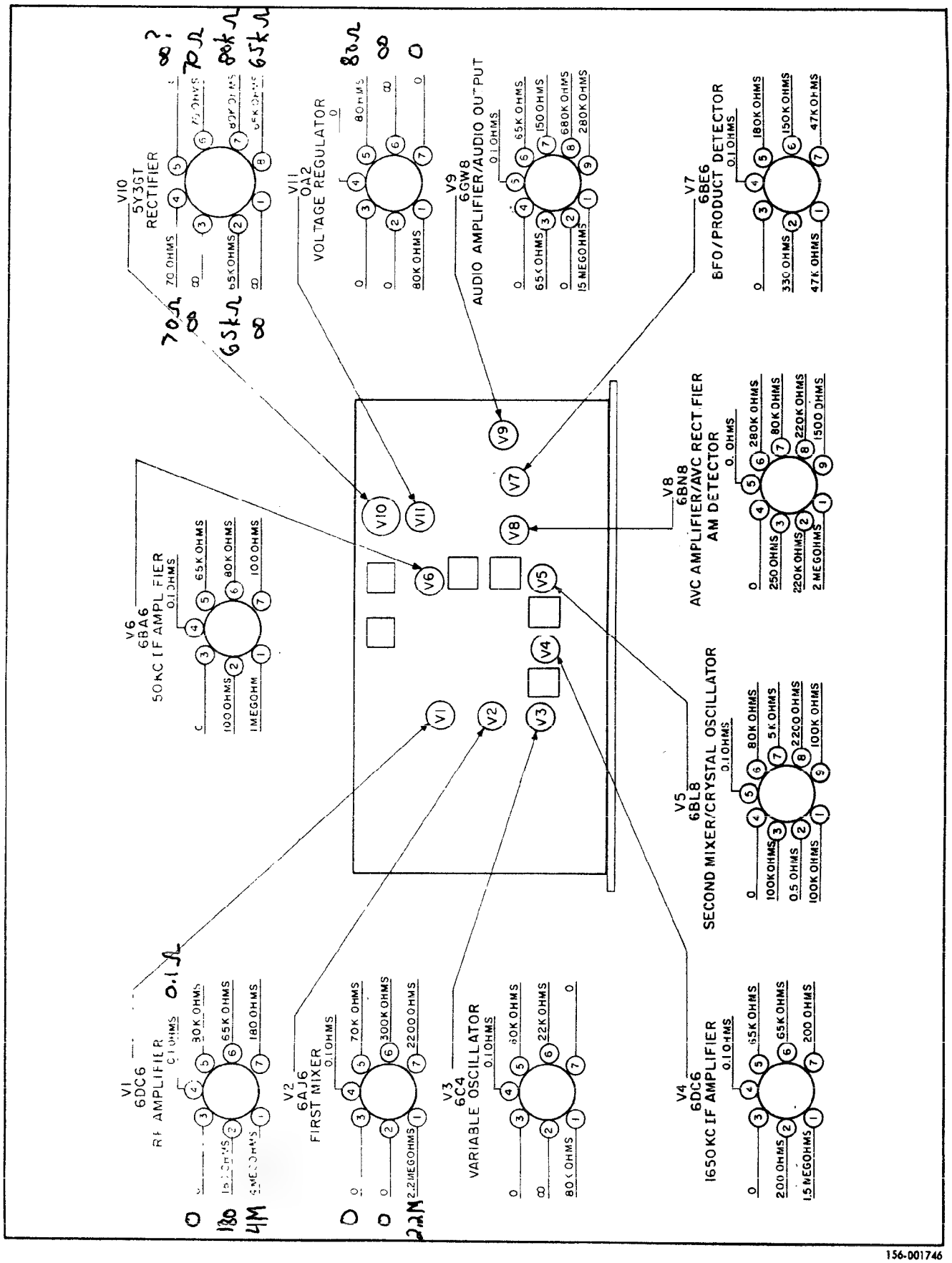


Figure 14. Voltage Chart of Receiver.



156-001746

Figure 15. Resistance Chart of Receiver.

SECTION VII
100-KC CRYSTAL CALIBRATOR
MODEL HA-7

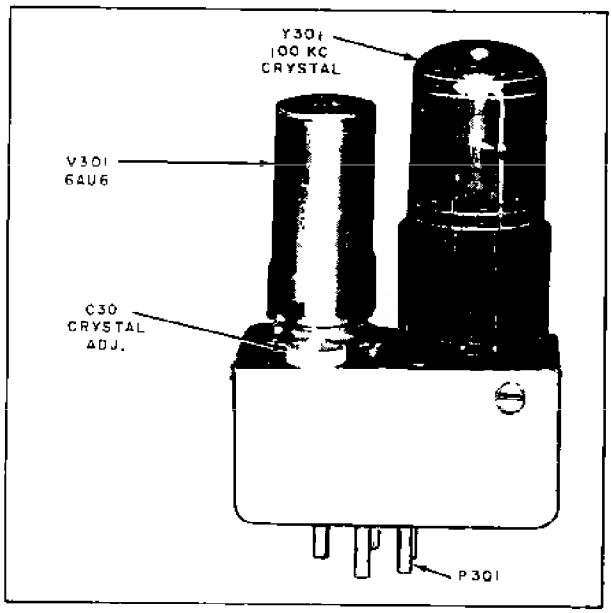


Figure 16 Model HA 7 100 KC Crystal Calibrator. 156-00,0-31

7-1. GENERAL.

The Model HA-7 100-KC Crystal Calibrator is a precision-built accessory which provides marker signals at every 100 KC on the dial of the SX-122 enabling the operator to check calibration accuracy. The HA-7 is placed into operation by plugging it into the appropriate socket (J1) on the receiver chassis (see figure 8) and placing the front panel CAL-OFF switch in the CAL position (refer to paragraph 3-10).

IMPORTANT

The CAL-OFF switch should be returned to the OFF position after calibration to prevent spurious signal generation.

7-2. ADJUSTMENT.

A trimmer capacitor, adjustable by the Crystal Adj control on the top of the calibrator unit, permits adjustment of the calibrating crystal to exactly 100 KC by comparison with the frequencies transmitted by station WWV. This capacitor has been set at the factory and normally should not require readjustment unless extreme calibration accuracy is required. If adjustment should be necessary, proceed as outlined in paragraph 4-7 of this document.

PARTS LIST

SCHEMATIC SYMBOL	DESCRIPTION	HALLICRAFTERS PART NUMBER
	100-KC Crystal Calibrator Assembly (Model HA-7)	001-004394
C301	Capacitor, Variable, 8 to 50 $\mu\mu$F, Crystal Adj.	044-20043[illegible]
C302,304	Capacitor, 0.01 μF, 500V, Ceramic Disc	047-100224
C303	Capacitor, 82 $\mu\mu$F, 10%, Mica	470-213820
CR301	Diode, Type 1N295	019-301980
P301	Plug, 5-Pin (Connects to J1 on SX-122)	035-10003[illegible]
R301 304	Resistor, 220K Ohms, 10%, 1/2 watt, Carbon	451-252224
R302	Resistor, 4700 Ohms, 10%, 1/2 watt, Carbon	451-252472
R303	Resistor, 100K Ohms, 10%, 1/2 watt, Carbon	451-252104
V301	Electron Tube, Type 6AU6	090-90080[illegible]
Y301	Crystal, 100-KC Marker	019-202351
	Shield, Cover	069-001719
	Socket, Crystal (Y301)	006-200296
	Socket, Tube (V301)	006-100759

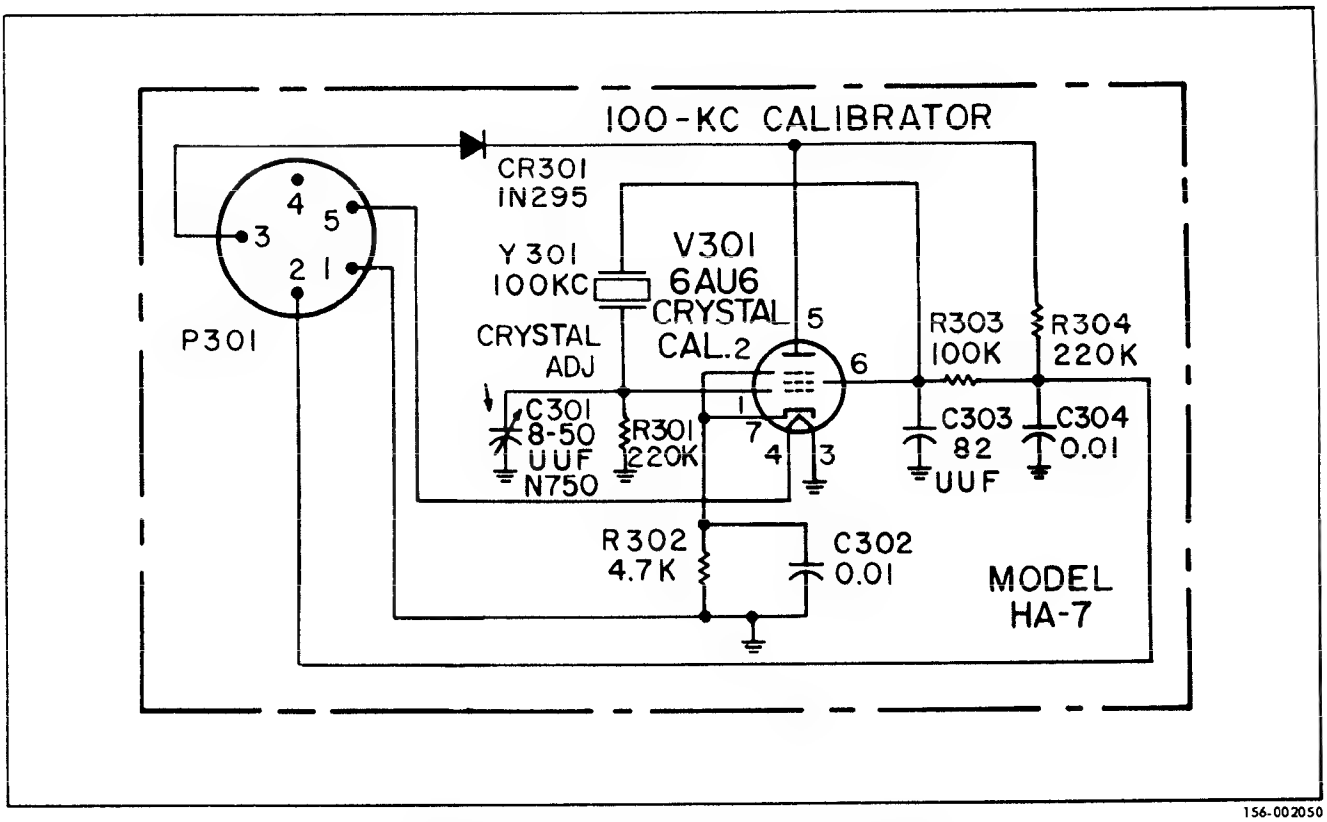


Figure 18 Schematic Diagram, Model HA-7 Crystal Calibrator.

SERVICE REPAIR PARTS LIST

SCHEMATIC SYMBOL	DESCRIPTION	HALLICRAFTERS PART NUMBER
	CAPACITORS	
C1,25,33, 42,45,52	2.2 μμF, 10%, 500V, Composition	047-200403-04
C2	Variable, 4.6 μμF to 57 μμF, ANTENNA Trimmer	048-000546
C3A,B,& C	Variable, TUNING	048-000547
C4,43,85	220 μμF, 5%, 500V, Plastic Mica	493-110221-234
C5,18,21, 26,28,34, 40,82	0.02 μF, +80%, -20%, 500V, Ceramic Disc	047-100242
C6,9,10,11, 12,44,76,93	0.005 μF, +80%, -20%, 500V, Ceramic Disc	047-101381
C7,8,35	10 μμF, 5%, 500V, Plastic Mica	493-110100-231
C13,15,22, 84,92,95	0.01 μF, +80%, -20%, 500V, Ceramic Disc	047-100217
C14,29,39, 41,94	0.1 μF, +80%, -20%, 50V, Ceramic Disc	047-001146
C16,30	100 μμF, 5%, 500V, Plastic Mica	493-110101-234
C17	47 μμF, 5%, 500V, Plastic Mica	493-110470-233
C19	20 μμF, 5%, 500V, Plastic Mica	493-110200-231
C20	120 μμF, 5%, 500V, Plastic Mica	493-110121-234
C23,24, 31,32	330 μμF, 5%, 500V, Plastic Mica	493-110331-234
C27,37,80, 81,83,90, 91,98	0.001 μF, 20%, 500V, Ceramic Disc	047-101671
C36	330 μμF, 5%, 500V, Plastic Mica	493-110331-234
C38	1000 μμF, 5%, 500V, Plastic Mica	493-110102-234
C46,54	25 μμF, 10%, N750, Ceramic Tubular	491-006250-95
C47	Variable, Trimmer, 1.5 μμF to 15 μμF	044-100399
C48,49,62	Variable, Trimmer, 3 μμF to 30 μμF	044-100396
C50	Variable, Trimmer, 4 μμF to 80 μμF	044-100395
C51A & B	Variable, BANDSPREAD	048-000548
C53,74	100 μμF, 10%, N750, Ceramic Tubular	491-026101-94
C55	7 μμF, ±0.25 μμF, N1500, Ceramic	479-011070
C56,58	5 μμF, ±0.25 μμF, N3300, Ceramic	479-031050
C57	11 μμF, 5%, N1500, Ceramic	479-015110
C59	Variable, Trimmer, 4.5 μμF to 25 μμF, NPO	044-200453
C60	Variable, Trimmer, 2.5 μμF to 13 μμF, NPO	044-200452
C61	Variable, Trimmer, 4.5 μμF to 25 μμF, NPO	044-200451
C63	1000 μμF, 5%, 500V, N2200, Ceramic	047-200441
C64	1300 μμF, 5%, 500V, Plastic Mica	493-310132-234
C65	100 μμF, 10%, NPO, Ceramic Tubular	491-056101-22
C66	680 μμF, 5%, 500V, Plastic Mica	493-310681-234
C67	320 μμF, 5%, N750, Ceramic Tubular	491-065321-94
C68	10 μμF, 10%, NPO, Ceramic Tubular	491-006100-22
C69	240 μμF, 5%, 500V, Plastic Mica	493-110241-234
C70	220 μμF, 5%, N330, Ceramic Tubular	491-065221-73
C71	Variable, Trimmer, 116 μμF to 160 μμF	044-100398
C72	10 μμF, ±0.5 μμF, N3300, Ceramic	479-032100
C73	1.0 μμF, ±0.1 μμF, N2200, Ceramic	479-220010
C75	1.0 μμF, 10%, N750, Ceramic Tubular	491-006010-94
C77	12 μμF, 250V, Electrolytic	045-001121
C78,87	4700 μμF, 5%, 400V, Paper Tubular	046-001312-03
C79,88	0.01 μF, 5%, 400V, Paper Tubular	046-001316-03
C86,96	470 μμF, 5%, 500V, Plastic Mica	493-110471-234
C89	0.47 μF, 10%, 200V Paper Tubular	046-001302-04
C97	10 μF, 25V, Electrolytic	045-000934
C98 A,B & C	30 μF, 450V, 20 μF, 450V, 20 μF, 400V; Electrolytic	045-200113
C100	5 μμF, 5%, 500V, Plastic Mica	493-110050-231

SCHEMATIC SYMBOL	DESCRIPTION	HALLICRAFTERS PART NUMBER
	*** RESISTORS**	
R1,26,56	1 Megohm	451-252105
R2	22 Ohms	451-252220
R3,7,14	15 Ohms	451-252150
R4	180 Ohms	451-252181
R5,17	33K Ohms, 1 watt	451-352333
R6,12,22, 31,35,36,58	100K Ohms	451-252104
R8	2.2 Megohms	451-252225
R9,23	2200 Ohms	451-252222
R10,47, 49,50,62	220K Ohms	451-252224
R11,29, 38,39	3300 Ohms	451-252332
R13	Variable, 2 Megohms, 30%, 1/4 watt, Meter Sensitivity	025-001957
R15	150 Ohms	451-252151
R16	Variable, 400 Ohms, 30%, 1 watt, Meter Zero	025-002293
R18	120K Ohms	451-252124
R19,48	1500 Ohms	451-252152
R20	4700 Ohms	451-252472
R21,28, 41,45	22K Ohms	451-252223
R24	47K Ohms, 2 watts	451-652473
R25	22K Ohms, 1 watt	451-352223
R27	100 Ohms	451-252101
R30,32	47K Ohms	451-252473
R33	330 Ohms	451-252331
R34	68K Ohms	451-252683
R37	6800 Ohms, 1 watt	451-352682
R40	3300 Ohms, 1 watt	451-352332
R42	10K Ohms, 1 watt	451-352103
R43	6K Ohms, 5 watts, wire wound	445-012602
R44	10K Ohms	451-252103
R46	3.9 Megohms	451-252395
R51,53	220 Ohms	451-252221
R52,54	390 Ohms	451-252391
R55	820K Ohms	451-252824
R57	180K Ohms	451-252184
R59	10 Megohms	451-252106
R60	Variable, 500K Ohms, 30%, 1/8 watt, AUDIO GAIN	025-002254
R61	15 Megohms	451-252156
R63	680K Ohms	451-252684
R64	150 Ohms, 1 watt	451-352151
R65	Variable, 10K Ohms, 20%, 1 watt, RF GAIN	025-002253
R66	330K Ohms	451-252334
R67	47 Ohms, 1 watt	451-352470
R68	300 Ohms, 5 watts, wire wound	445-012301
R69	1500 Ohms, 5 watts, wire wound	445-012152

* All Resistors are carbon type, 10%, 1/2 watt, unless otherwise specified.

	COILS AND TRANSFORMERS	
L1	Coil, Antenna, Band 1	050-000952
L2	Coil, Antenna, Band 2	050-000952
L3	Coil, Antenna, Band 3	050-000954
L4	Coil, Antenna, Band 4	050-000955
L5	Coil, BFO	054-000059
L6	Coil, Mixer, Bands 1 and 2	051-201319
L7	Coil, Mixer, Band 3	051-201326
L8	Coil, Mixer, Band 4	051-201327
L9	Coil, Oscillator, Band 1	051-201328
L10	Coil, Oscillator, Band 2	051-201921
L11	Coil, Oscillator, Band 3	051-201933
L12	Coil, Oscillator, Band 4	051-201321
T1,2	Transformer, 1650-KC IF	050-000788
T3,4,5,6	Transformer, 50-KC IF	050-200489
T7	Transformer, Output	055-000519
T8	Transformer, Power	052-300221
	ELECTRON TUBES AND DIODES	
V1,4	Tube, Type 6DC6	090-901328
V2	Tube, Type 6AU6	090-200808
V3	Tube, Type 6C4	090-900830
V5	Tube, Type 6BL8	090-901350
V6	Tube, Type 6BA6	090-901112
V7	Tube, Type 6BE6	090-901124
V8	Tube, Type 6BN8	090-001465

SCHEMATIC SYMBOL	
	ELECT
V9	T
V10	T
V11	T
CR1	D
S1	R
S1A	W
S1B	W
S1C	W
S1D	W
S2	Sl
S3	R
S4	R
S5	Sl
	B
	C
	C
	C
	C
	C
	C
	C
	C
	D
	D
	E
	D
	D
	E
	F
	F
	F
F1	F
	F
	G
J2	Ja
	K
	a
	K
	T
	S
	L
	L
	M
M1	M
DS1,2,3	P
	P
	T
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	B
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J1	So
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TB1,2	Te
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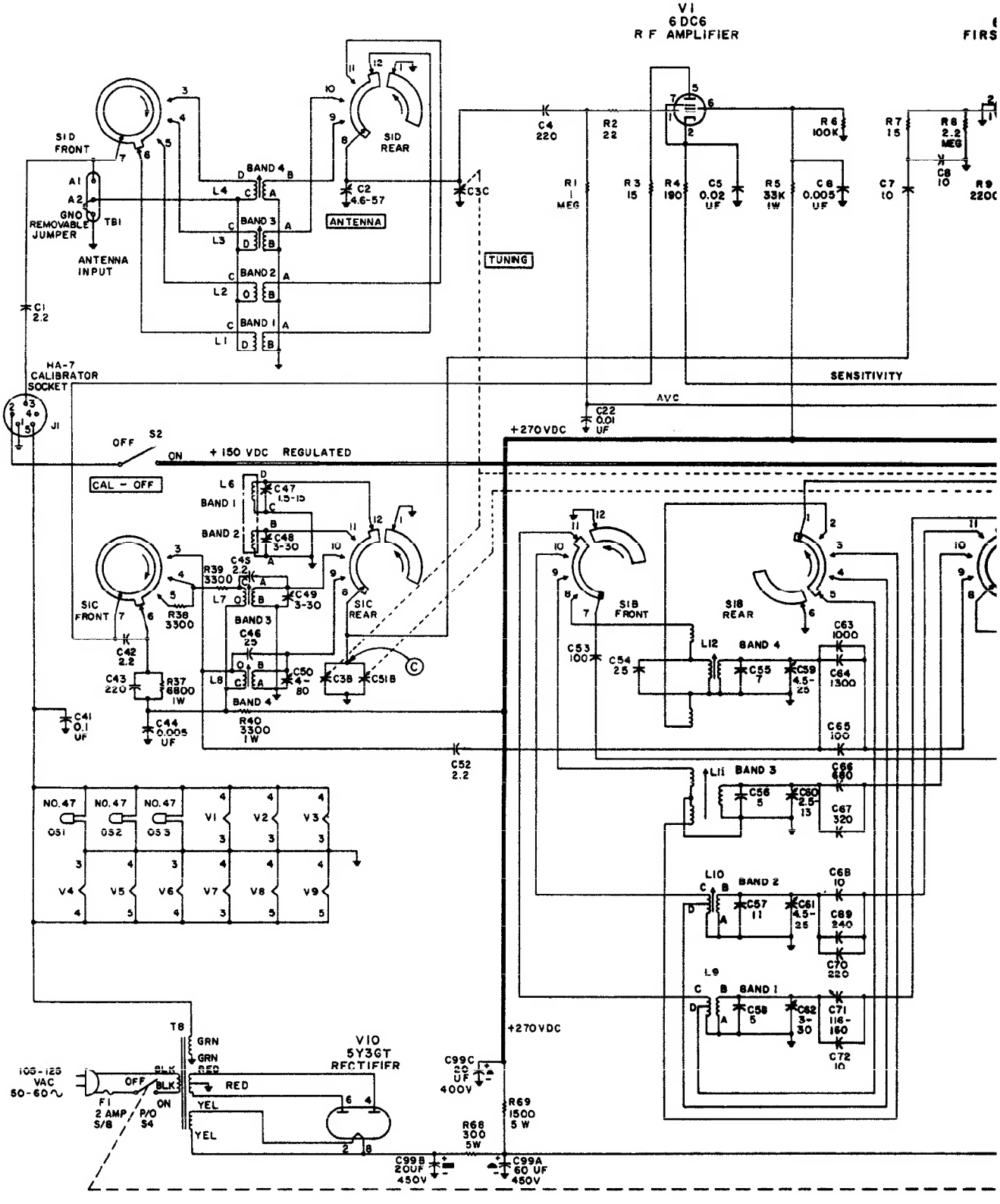
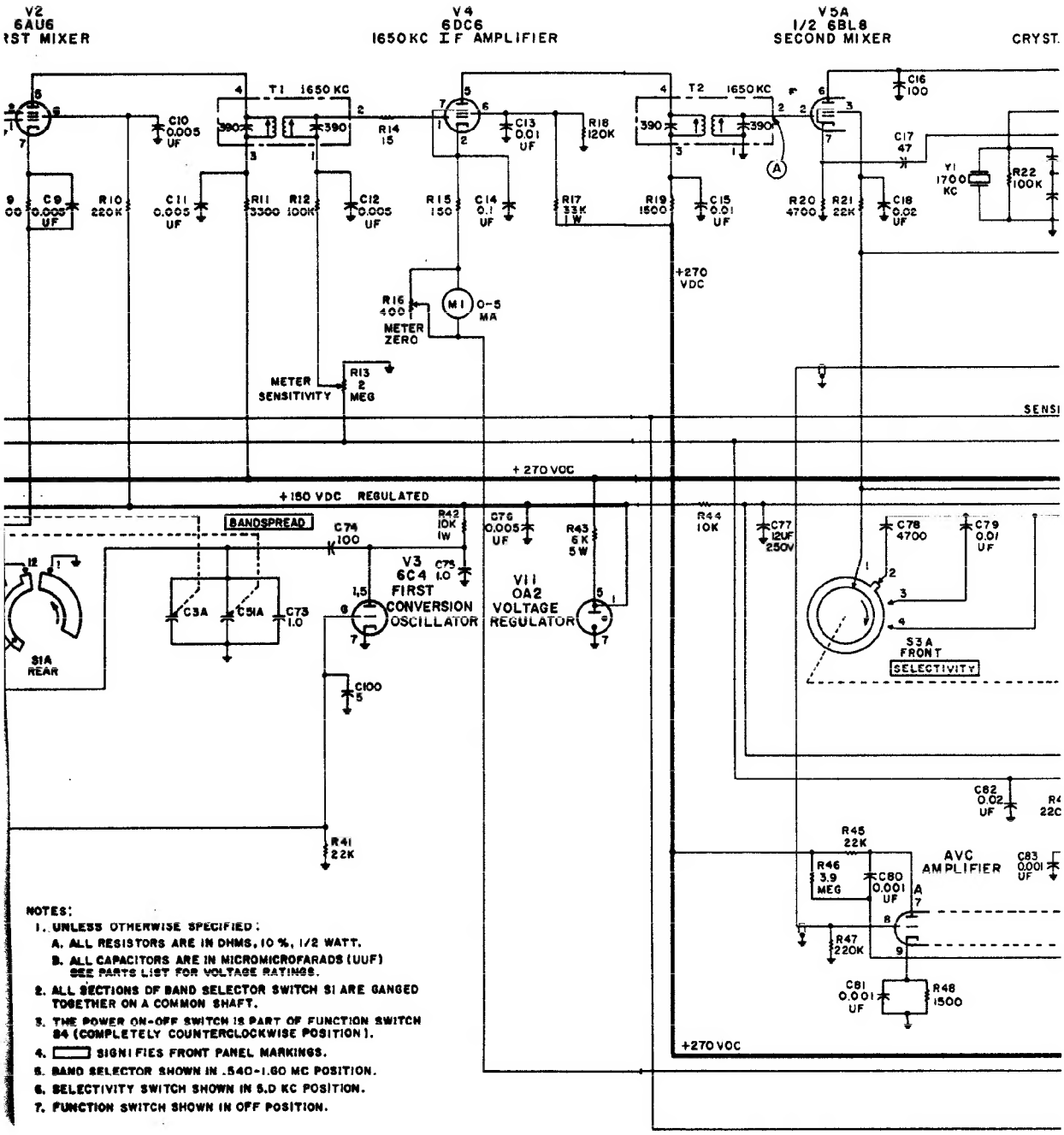
IST

HALLICRAFTERS PART NUMBER	SCHEMATIC SYMBOL	DESCRIPTION	HALLICRAFTERS PART NUMBER
S1 FR			
		ELECTRON TUBES AND DIODES (CONT)	
451-252105	V9	Tube, Type 6GW8	090-001502
451-252220	V10	Tube, Type 5Y3GT	090-901111
451-252150	V11	Tube, Type OA2	090-900001
451-252181	CR1	Diode, Type 1N456	019-002964
G 451-352333			
REMOVE JUMPER 451-252104			
		SWITCHES	
	S1	Rotary, BAND SELECTOR	----------
451-252225	S1A	Wafer, Oscillator	062-200055
451-252222	S1B	Wafer, Oscillator	062-200054
451-252224	S1C	Wafer, Mixer	062-200053
	S1D	Wafer, Antenna	062-200053
*C1 2.2 451-252332	S2	Slide, SPDT, CAL-OFF	060-002548
	S3	Rotary, SELECTIVITY	060-002626
025-001957	S4	Rotary, FUNCTION (Inc. ON/OFF)	060-002628
	S5	Slide, SPDT, ANL-OFF	060-002546
HA-451-252151			
CALIBRATOR 025-002293			
SOCKET		MISCELLANEOUS	
451-252124		Bracket, Meter Mounting	067-011850
451-252152		Cabinet	066-004055
J1 451-252472		Cabinet Bottom Assembly	150-006769
451-252223		Cabinet Top Assembly	150-006770
		Clip, IF Transformer Mounting	076-003779
451-252473		Core, Coil Tuning (L3-4-7-8-10)	077-100068
451-352223		Core, Coil Tuning (L5)	003-103289
451-252101		Core, Coil Tuning (L11)	003-101543
451-252473		Core, Coil Tuning (L12)	077-101336
451-252331		Core, Coil Tuning (T3-4-5-6)	003-101631
451-252883	Y1	Crystal, 1700 KC	019-003231
451-352682		Dial Cord, Bandspread Gang	038-000061
451-352332		Dial Cord, Tuning and Bandspread Dials	038-000049
451-352103			
445-012602		Dial Scale, BANDSPREAD	083-001029
451-252103		Dial Scale, TUNING	083-001030
451-252305		Escutcheon, Front Panel	007-000871
451-252221		Feet, Plastic Mounting	016-201072
451-252391		Flywheel	071-000212-02
451-252824		Front Panel	068-001455
451-252184	F1	Fuse, 2 Ampere, S/B	039-100428
451-252106		Fuse Holder (Inc. Hardware)	006-200645
025-002254		Glass, Dial Window	022-000711
	J2	Jack, PHONES	036-000350
J 451-252156		Knob, TUNING and BANDSPREAD	015-001593
451-252684			
451-352151		Knob, RF GAIN, BAND SELECTOR, ANTENNA, AUDIO GAIN SELECTIVITY, BFO, and FUNCTION	015-001760
025-002253			
451-252334		Line Cord	087-100078
NO.4 451-352470		Lock, Line Cord	076-100397
C 445-012301		Medallion, Hallicrafters H	007-000850
OSI 445-012152	M1	Meter, 0-5 MA Deflection	082-000603
	DS1,2,3	Pilot Lamp, Type NO. 47	039-100004
'2 watt.		Pointer, BANDSPREAD and TUNING Dials	082-000600
V		Shaft and Index Plate, BAND SELECTOR	074-200172
		Shaft, Antenna Trimmer	074-002883
050-000952		Shaft, Control, TUNING and BANDSPREAD	074-002878
050-000953			
050-000954	J1	Socket, Accessory (HA-7)	006-100186
050-000955		Socket, Pilot Light (Bandspread Dial)	086-000665-02
054-000059			
051-201319		Socket, Pilot Light (Meter Dial)	086-000666
051-201326		Socket, Pilot Light (Tuning Dial)	086-000665-01
051-201327		Socket, Tube, Octal (V10)	006-200296
051-201328		Socket, Tube, 7-pin miniature (V1-2-4)	006-200633
051-201921			
051-201933		Socket, Tube, 7-pin miniature (V3)	006-001048
105-125 VAC 051-201321		Socket, Tube, 7-pin miniature (V6-7)	006-000946
50-60~ 050-000788			
050-200489		Socket, Tube, 7-pin miniature (V11)	006-100644
055-000519			
052-300221		Socket, Tube, 9-pin miniature (V5)	006-200672
		Socket, Tube, 9-pin miniature (V8-9)	006-200493
		Spring, Dial Cord Tension, Bandspread Gang	075-000139
090-901328			
090-200806		Spring, Dial Cord Tension, Tuning and Bandspread Dials	075-000893
090-900830			
090-901350	TB1,2	Terminal Board, Antenna and Speaker	088-002461
090-901112			
090-901124		Tube Shield (V1-2-4)	069-000097
090-001465		Tube Shield (V5)	069-000855

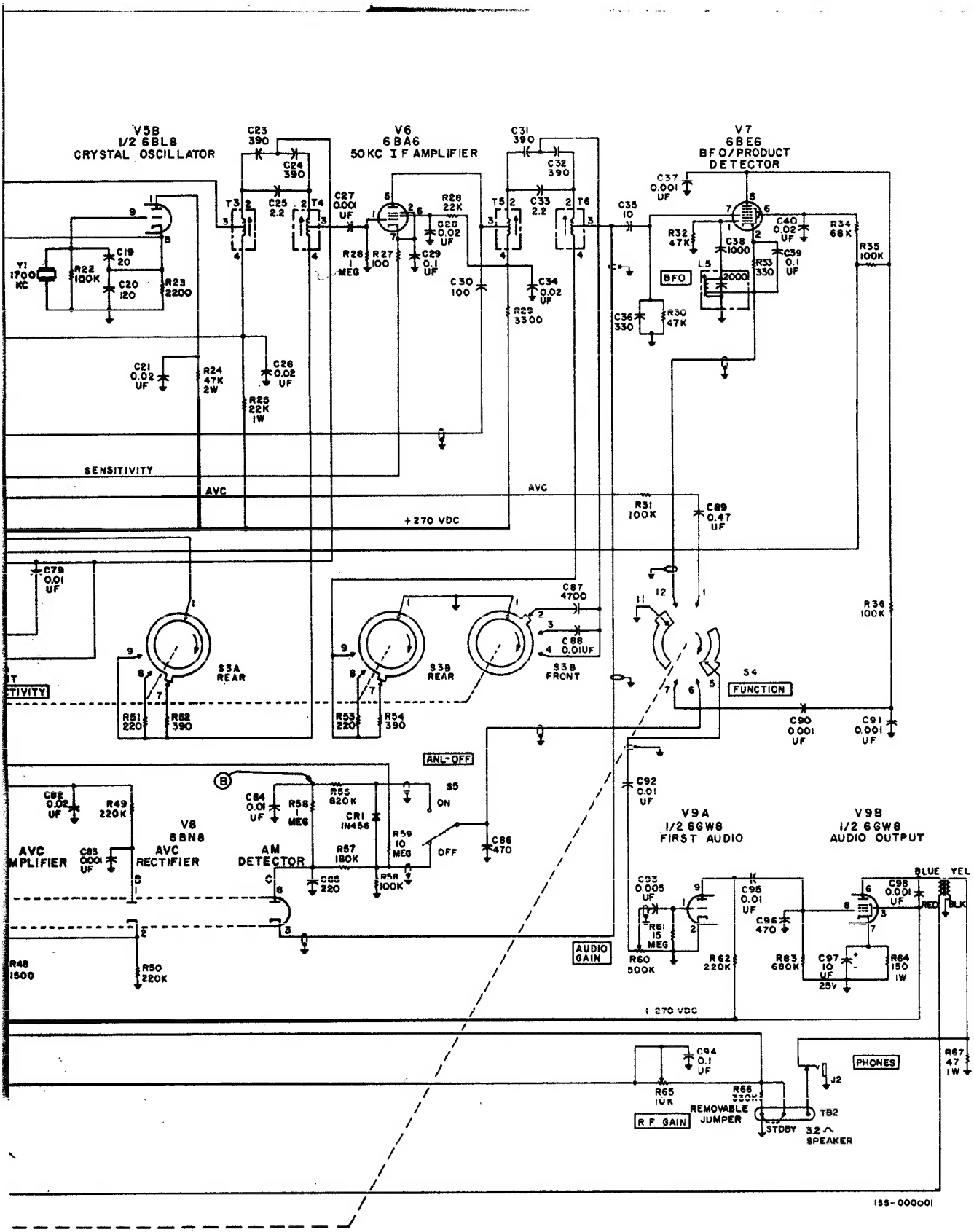

V1
6DC6
R F AMPLIFIER
SID
FRONT
SID
REAR
BAND 4
BAND 3
BAND 2
BAND 1
ANTENNA
TUNING
GND
REMOVABLE
JUMPER
TB1
ANTENNA
INPUT
C1
2.2
C2
4.6-57
C3C
C4
220
R2
22
R1
1
MEG
R3
15
R4
190
C5
0.02
UF
R5
33K
1W
C6
0.005
UF
R6
100K
R7
15
R8
2.2
MEG
C8
10
C7
10
R9
220C
SENSITIVITY
AVC
C22
0.01
UF
+270VDC
HA-7
CALIBRATOR
SOCKET
J1
S2
OFF
ON
+150 VDC REGULATED
CAL - OFF
L6
C47
1.5-15
C48
3-30
C45
2.2
R39
3300
C49
3-30
SIC
FRONT
SIC
REAR
R38
3300
C42
2.2
C43
220
R37
6800
1W
C46
25
C50
4-
80
C38
C51B
C41
0.1
UF
C44
0.005
UF
R40
3300
1W
C52
2.2
S1B
FRONT
S1B
REAR
L12
C53
100
C54
25
C55
7
C59
4.5-
25
C63
1000
C64
1300
C65
100
L11
C56
5
C60
2.5-
13
C66
680
C67
320
L10
C57
11
C61
4.5-
25
C68
10
C69
240
C70
220
L9
C58
5
C62
3-
30
C71
116-
160
C72
10
NO.47
051
NO.47
052
NO.47
053
V1
V2
V3
V4
V5
V6
V7
V8
V9
T8
105-125
VAC
50-60~
OFF
ON
BLK
BLK
GRN
GRN
RED
RED
YEL
YEL
F1
2 AMP
S/B
P/O
S4
V10
5Y3GT
RECTIFIER
C99C
20
UF
400V
R69
1500
5 W
R68
300
5W
C99B
200UF
450V
C99A
60 UF
450V
+270VDC



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   A. ALL RESISTORS ARE IN OHMS, 10 %, 1/2 WATT.
   B. ALL CAPACITORS ARE IN MICROMICROFARADS (UUF) SEE PARTS LIST FOR VOLTAGE RATINGS.
2. ALL SECTIONS OF BAND SELECTOR SWITCH S1 ARE GANGED TOGETHER ON A COMMON SHAFT.
3. THE POWER ON-OFF SWITCH IS PART OF FUNCTION SWITCH S4 (COMPLETELY COUNTERCLOCKWISE POSITION).
4. ▭ SIGNIFIES FRONT PANEL MARKINGS.
5. BAND SELECTOR SHOWN IN .540-1.60 MC POSITION.
6. SELECTIVITY SWITCH SHOWN IN 5.0 KC POSITION.
7. FUNCTION SWITCH SHOWN IN OFF POSITION.

Figure 18. Schematic Diagram, Model SX-122 Receiver.


V5B
1/2 6BL8
CRYSTAL OSCILLATOR
V6
6BA6
50KC I F AMPLIFIER
V7
6BE6
BFO/PRODUCT
DETECTOR
Y1
1700
KC
C19
20
C20
120
R22
100K
R23
2200
C23
390
C24
390
C25
2.2
T3
T4
C27
0.001
UF
R26
1
MEG
R27
100
R28
22K
C28
0.02
UF
C29
0.1
UF
C30
100
C31
390
C32
390
C33
2.2
T5
T6
C34
0.02
UF
R29
3300
C35
10
C37
0.001
UF
R32
47K
C38
1000
C40
0.02
UF
R34
68K
R35
100K
BFO
L5
2000
R33
330
C39
0.1
UF
C36
330
R30
47K
C21
0.02
UF
R24
47K
2W
C26
0.02
UF
R25
22K
1W
SENSITIVITY
AVC
AVC
+270 VDC
R31
100K
C89
0.47
UF
C79
0.01
UF
S3A
REAR
S3B
REAR
S3B
FRONT
C87
4700
C88
0.01UF
S4
FUNCTION
R36
100K
R51
220
R52
390
R53
220
R54
390
C90
0.001
UF
C91
0.001
UF
ANL-OFF
S5
ON
OFF
C92
0.01
UF
C82
0.02
UF
R49
220K
C84
0.01
UF
R58
1
MEG
R55
820K
CR1
IN456
R59
10
MEG
C86
470
V8
6BN8
AVC
MPLIFIER
C83
0.001
UF
AVC
RECTIFIER
AM
DETECTOR
R57
180K
C85
220
R56
100K
R48
1500
R50
220K
V9A
1/2 6GW8
FIRST AUDIO
V9B
1/2 6GW8
AUDIO OUTPUT
C93
0.005
UF
C95
0.01
UF
R61
15
MEG
R60
500K
R62
220K
C96
470
C98
0.001
UF
BLUE
YEL
RED
BLK
R63
680K
C97
10
UF
25V
R64
150
1W
AUDIO
GAIN
+270 VDC
C94
0.1
UF
R65
10K
R66
330K
R F GAIN
REMOVABLE
JUMPER
PHONES
J2
TB2
STDBY
3.2Ω
SPEAKER
R67
47
1W
155-000001